

# GC0127 & GC0128:

**Mod Title:** EU Code Emergency & Restoration: Requirements resulting from System Defence and Restoration Plans

01	Proposal form
02	Workgroup Consultation
03	Workgroup Report
04	Code Administrator Consultation
05	Draft Final Modification Report
06	Final Modification Report

**Purpose of Modification:** The European Emergency and Restoration Network Code (“E&R NC”) requires the publication of a System Defence Plan and a System Restoration Plan. This Modification seeks to incorporate the obligations on GB Parties arising from the System Defence Plan and the System Restoration Plan into the GB Grid Code that need to be implemented by 18 December 2019. National Grid ESO will notify GB Parties impacted by the implementation of E&R NC and the measures they have to meet. Following such notification GB Parties will have 12 months to implement the measures specified.

This Final Modification Report has been prepared in accordance with the terms of the Grid Code. An electronic version of this document and all other GC0127&GC0128 related documentation can be found on the National Grid ESO website via the following link:

<https://www.nationalgrideso.com/codes/grid-code/modifications/gc0127-eu-code-emergency-restoration-requirements-resulting-system>



At the Grid Code Review Panel meeting on 28 November 2019, the majority of Panel members recommended that the GC0127/128 Original, WAGCM1, WAGCM2 and WAGCM3 better facilitated the Grid Code Objectives when compared with the Baseline. Of the 9 votes, 7 thought the Original was the best option, 1 thought WAGCM2 was the best option and 1 thought WAGCM3 was best option.

The purpose of this document is to assist the Authority in making its determination on whether to implement GC0127 & GC0128.

	<p><b>High Impact:</b></p> <p><b>GC0127:</b> National Grid ESO, Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers and Virtual Lead Parties who have signed a CUSC Contract</p> <p><b>GC0128:</b> National Grid ESO, Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers, Providers of Black Start Services and Virtual Lead Parties who have signed a CUSC Contract</p> <p><b>Alternative solutions</b></p> <p>Three alternatives have been raised:</p> <ol style="list-style-type: none"> <li>1) This alternative, if approved by Ofgem would have a high impact on non-CUSC parties;</li> <li>2) This alternative, if approved by Ofgem would have an impact on Electricity Storage providers; and</li> <li>3) This alternative is a combination of the two alternatives above.</li> </ol>
	<p><b>The Workgroup concluded:</b></p> <p>Workgroup Members unanimously concluded that the Original Proposal better facilitated the Grid Code Objectives than the baseline.</p> <p>Workgroup Members unanimously concluded that WAGCM1, WAGCM2 and WAGCM3 better facilitated the Grid Code Objectives than the baseline.</p> <p>Workgroup Members by majority concluded that the Original was best overall.</p>

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## Timetable

### The Code Administrator recommends the following timetable:

Presented to Panel	25 April 2019
Initial consideration by Workgroup	May 2019
Workgroup Report presented to Panel	10 September 2019
Code Administration Consultation issued to the Industry (1 month)	18 October 2019
Code Administration Consultation closes	18 November 2019
Draft Final Modification Report presented to Panel	20 November 2019
Modification Panel decision	28 November 2019
Final Modification Report issued to the Authority	3 December 2019
Expected Authority Decision	16 December 2019
Decision implemented in Grid Code	17 December 2019

## 1 About this document

This document is the Final Modification Report that contains the discussion of the Workgroup which formed in May 2019 to develop and assess the proposal, the responses to the Workgroup Consultation which closed on 16 August 2019 and the voting of the Workgroup held on 28 August 2019. GC0127 and GC0128 were amalgamated at the July 2019 Panel meeting. The Panel reviewed the Workgroup Report at their Panel meeting on 10 September 2019 and agreed that the Workgroup

had met its Terms of Reference and that the Workgroup could be discharged. This document also contains the responses to the Code Administrator Consultation that closed on 18 November 2019.

GC0127 and GC0128 were proposed by National Grid ESO and were submitted to the Grid Code Review Panel for its consideration on 25 April 2019. The Panel decided to send the Proposal to a Workgroup to be developed and assessed against the Grid Code Objectives.

Section 2 (Original Proposal) and Section 3 (Proposer's Solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup.

Section 4 of the Workgroup Report contains the Impacts and Other Considerations of the Proposal and the potential solution.

Section 5 of the Workgroup Report contains the discussion by the Workgroup on the Proposal and the potential solution

The Workgroup consulted on this Modification and a total of 6 responses were received. These responses can be viewed in Section 6 of this Report.

### **Workgroup Conclusions**

The Workgroup met on 28 August 2019 and voted on whether the Original and the WAGCM would better facilitate the Grid Code Objectives than the baseline and what option was best overall.

Workgroup Members unanimously concluded that the Original Proposal better facilitates the Grid Code Objectives than the baseline.

Workgroup Members unanimously concluded that WAGCM1, WAGCM2 and WAGCM3 facilitated the Grid Code Objectives better than the baseline.

Workgroup Members by majority concluded that the Original was best overall.

### **Legal text for alternatives**

The Workgroup sought advice from the GCRP around whether to develop the legal text for the alternatives raised. The GCRP recommended that the legal text not be developed and sent a letter to the Authority, dated 12 September 2019, outlining their reasoning. The Authority responded on 24 September 2019 requesting that the legal text be developed ahead of issuing this Code Administrator Consultation. These letters can be located in Annex 7.

The Code Administrator, under Governance Rule 21.5, sought comments from the Workgroup through a webex where all Workgroup members joined, held on the 11 October 2019. The Workgroup commented and developed the legal text for the alternatives which can be found in Annex 4 with the Original proposal legal text.

### **Code Administrator responses**

The Code Administrator Consultation was carried out for one calendar month running from 18 October 2019 to the 18 November 2019. Eight responses were received.

### **Grid Code Review Panel Views**

At the Grid Code Review Panel meeting on 28 November 2019, the Panel members by majority recommended that GC0127/128 Original, WAGCM1, WAGCM2 and WAGCM3 better facilitated the Grid Code objectives than the Baseline. Of the 9 votes, 7 thought

the Original was the best option, 1 thought WAGCM2 and 1 thought WAGCM3 was the best option.

This Final Modification Report has been prepared in accordance with the terms of the Grid Code. An electronic copy can be found on the National Grid ESO website.

### **Terms of Reference**

The Grid Code Panel detailed in the Terms of Reference the scope of work for the GC0127 and GC0128 Workgroup and the specific areas that the Workgroup should consider. These are listed in the table below with a reference to where you can locate the information in the Report. The full Terms of Reference can be found in Annex 1.

#### **Terms of Reference GC0127**

<b>Specific Area</b>	<b>Location in the report</b>
Implementation and costs;	Section 2, 3 and 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0127 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users <ul style="list-style-type: none"> <li>• whether all types of storage are affected or those classified as SGU's</li> <li>• the load disconnection, frequencies and profiles being used</li> <li>• how to maintain the commercial services that are currently provided</li> <li>• Seek a view from the National Grid ESO in regards to the impact on system inertia</li> </ul>	Section 2, 3 & 5
Consider how balancing services will be obtained from Users that do not currently provide them	Section 2, 3 & 5

## Terms of Reference GC0128

Specific Area	Location in the report
Implementation and costs;	Section 2, 3 & 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0128 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users	Section 2, 3 & 5
Consider the impact of embedded generation as part of a black start restoration plan	Section 2, 3 & 5
Who can be a frequency leader, and under what circumstances	Section 2, 3 & 5

## Acronym Table

Acronym	Meaning
E&R NC	Emergency and Restoration Network Code <sup>1</sup>
DCC	Demand Connection Code
HVDC	High Voltage Direct Current

<sup>1</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2196&from=EN>

National Grid ESO	National Grid Electricity System Operator
SRP	System Restoration Plan
SDP	System Defence Plan
SGU	Significant Grid User
RfG	Requirements for Generators European Code
SOGL	Electricity Transmission System Operation Guideline 2017/1485
BM	Balancing Mechanism
STC	System Operator Transmission Owner Code

## 2 Original Proposal

***Section 2 (Original Proposal) and Section 3 (Proposer's Solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Code Administrator Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.***

### Defect

The [Emergency and Restoration Code Network Code \(E&R NC\)](#) requires the Electricity System Operator to create a [System Defence Plan \(SDP\)](#) and [System Restoration Plan \(SRP\)](#), which National Grid ESO produced and consulted on in September 2018. There are also requirements on energy storage units and SGUs in the SDP and SGU's in the SRP that are not currently in the Grid Code, and so the two need to be aligned for transparency.

The SDP and SRP need to be implemented by 18 December 2019 so these modifications will need to be in the Grid Code by the same date.

## What

This modification proposes to align E&R NC, the SDP, the SRP and the Grid Code.

## Why

This modification needs to progress to ensure the sections of the SDP and SRP that need to be implemented by 18 December 2019 meet those timescales.

These Proposals are two of a number of Proposals which seek to implement relevant provisions of a number of new EU Network Codes/Guidelines which have been introduced in order to enable progress towards a competitive and efficient internal market in electricity. The full set of EU network guidelines and codes are;

- Regulation 2015/1222- Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015;
- Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016;
- Regulation 2016/631- Requirements for Generators (RfG) which entered into force 17 May 2016;
- Regulation 2016/1388 – Demand Connection Code (DCC) which entered into force 7 September 2016;
- Regulation 2016/1447 – High Voltage Direct Current (HVDC) which entered into force 28 September 2016;
- Transmission System Operation Guideline (SOGL) - which entered into force 14 September 2017; and
- Regulation 2017/2196 - Emergency and Restoration (E&R) which entered into force 18 December 2017.

The Regulation establishing a Network Code on Emergency and Restoration entered into force on 18 December 2017. The E&R NC sets out rules relating to the management of the electricity transmission system in the emergency, blackout and restoration states. The main objective of the relevant rules is to bring the system back to the normal state as quickly and efficiently as possible.

## How – GC0127

In coordination with Article 15(3) of E&R and section 3.1.5 of the SDP specifies that:

*Energy Storage systems taking energy are required to automatically switch to generating mode or where it is not capable of doing this must automatically disconnect before the activation of Low Frequency Demand Disconnection Scheme.*

In coordination with Article 21(1b) of E&R, specifies that:

*1. In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from:*

- (a) any balancing service provider, which, upon the TSO request, shall change its availability status to make available all its active power, provided it was not already activated through the balancing market, and conforming to its technical constraints;*

- (b) any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints; and
- (c) other TSOs that are in the normal or alert state.

This requirement was also reflected in section 4.6.3 of the updated SDP.

## How – GC0128

- Frequency management within a Black Start (Articles 27(4))

### Frequency management within a Black Start (Articles 27(4))

#### Article 27 – Activation of the Re-energisation Procedure

Changes to clarify the requirements on Distribution System Operators (Transmission Owners and Distribution Network Operators) to provide demand, expected duration and risk information during a restoration. It is believed that the Grid Code already covers a number of these requirements although minor updates and points of clarification have been added to the legal text where necessary.

## Governance

The Proposer recommended that this modification progresses to a Workgroup to fully understand the consequences of these changes for SGUs and storage providers and to ensure that the technical solution is developed to allow minimum disruption for these parties. The Panel agreed with this recommendation.

## Technical Skillsets

Appreciation of the SDP, SRP and E&R.

## Reference Documents

Emergency and Restoration Code:

Emergency and Restoration consultation documents (including the System Defence Plan and System Restoration Plan):

Please note that these documents can be located at the following link;

<https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open>

## 3 Proposer's Solution

***Section 2 (Original Proposal) and Section 3 (Proposer's Solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Code Administrator Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.***

***Note that the proposed legal text changes being introduced through GC0127 and GC0128 (as put forward by the Proposer) are dependent on the GC0125 proposal.***

### GC0127

## System Emergency State

E&R NC Article 13(2)(a)

*In addition to the automatically activated schemes of the System Defence Plan, pursuant to point (a) of Article 11(5), each TSO shall activate a procedure of the System Defence Plan when the System is in Emergency State in accordance with the criteria set out in Article 18(3) or Regulation (EU) 2017/1485 and there are no remedial actions available to restore the system to the normal state”.*

It was noted that as part of System Operator Guideline (SOGL) that this requirement had not been included within Grid Code Working Groups GC0095, GC0106 and GC0114. As such section 2.1.1 and 2.1.2 of the System Defence Plan have been updated to reflect this requirement.

## Storage providers

E&R NC Article 15(3) states that:

*Prior to the activation of the automatic low frequency demand disconnection scheme, each TSO and DSO identified pursuant to Article 11(4) shall foresee that energy storage units acting as load connected to its system:*

*(a) automatically switch to generation mode within the time limit and at an active power set-point established by the TSO in the system defence plan; or*

*(b) when the energy storage unit is not capable of switching within the time limit established by the TSO in the system defence plan, automatically disconnect the energy storage unit acting as load.*

This issue was discussed at the Workgroup and System Defence Plan clause 3.1.5 has now been updated to reflect these discussions.

Under the requirements that are proposed to be introduced through GC0096 (Storage), where Electricity Storage Modules would be treated as being owned by Generators (i.e. a Storage would be treated as a subset of Generation) then in respect of Electricity Storage Modules which are charging, they are required to automatically disconnect in accordance with the requirements of OC6 of the Grid Code before the activation of the Low Frequency Demand Disconnection Scheme. Article 15(3) and Article 15(4) of E&R NC places requirements on energy storage units acting as a load to automatically switch to generation mode during periods of low System Frequency. This action would need to take place between 49.5Hz (the threshold associated with LFSM-U) and 48.8Hz (the threshold associated with the first stage of LFDD). National Grid ESO does not consider the action of automatic switching storage units from load to generation appropriate until further study work has been completed, due to the risk of any unintended consequences, the variable droop rates and the differences in performance between storage technologies. Under the proposed System Defence Plan, National Grid ESO define the cycle time from import to export to be set to a very low value (e.g. 1µs) so the default option will be for the storage plant to trip under low frequency. The settings will be specified on a case by case basis through the Bilateral Agreement and would be within the range of 49.5Hz – 48.8Hz. This approach would be consistent with that suggested for Storage under the GC0096 proposals, the proposals of the (EU) Grid Connection Stakeholder Committee’s Storage Expert Group and the approach adopted for Pumped Storage.

The Proposer does however note two observations. Firstly, the Connection Network Codes (RfG, HVDC and DCC) explicitly exclude storage. Secondly, as a separate GB Modification (outside of the EU Codes) a Workgroup has been established to investigate how the Storage technologies should be treated under the auspices of the GB Grid Code. This modification (GC0096) is nearing its conclusion and expected to be approved into the Grid Code at some time over the Summer/Autumn of 2019. In preparation of the additional text, many of the terms developed as part of the GC0096 proposal have been used as part of this modification. As there is significant overlap between the GC0127 proposals and GC0096 proposals, and noting that GC0096 is still to be approved, the legal text that is relevant to the GC0127 modification (which has been taken from the GC0096 proposals) has been highlighted in blue text.

It is however important to note that E&R NC defines requirements for storage plant to be capable of switching from an importing mode to an exporting mode during periods of low frequency. This issue has not been addressed as part of the GC0096 Workgroup, although as part of this GC0127 modification initial consideration was given to this approach. The initial view of the Proposer was that a capability could be proposed as shown in Figure 1.0 below, however this was soon discounted on the basis of the variation in storage technologies, variable droop rates and unintended system consequences, whilst also noting that similar requirements do not apply to Pumped Storage or HVDC technologies. In addition, a separate (EU) Grid Connection Stakeholder Committee Expert Group was established in the autumn of 2018 to consider how the EU Connection Network Codes could be updated to consider the requirements for Storage. The requirements of Article 15(3) of (EU) Grid Connection Stakeholder Committee which relate to Storage were discussed as part of this Expert Group

([https://docstore.entsoe.eu/Documents/Network%20codes%20documents/GC%20ESC/STORAGE/TOP\\_4\\_Report\\_from\\_EG\\_STORAGE.pdf](https://docstore.entsoe.eu/Documents/Network%20codes%20documents/GC%20ESC/STORAGE/TOP_4_Report_from_EG_STORAGE.pdf)) and the same conclusion was reached.

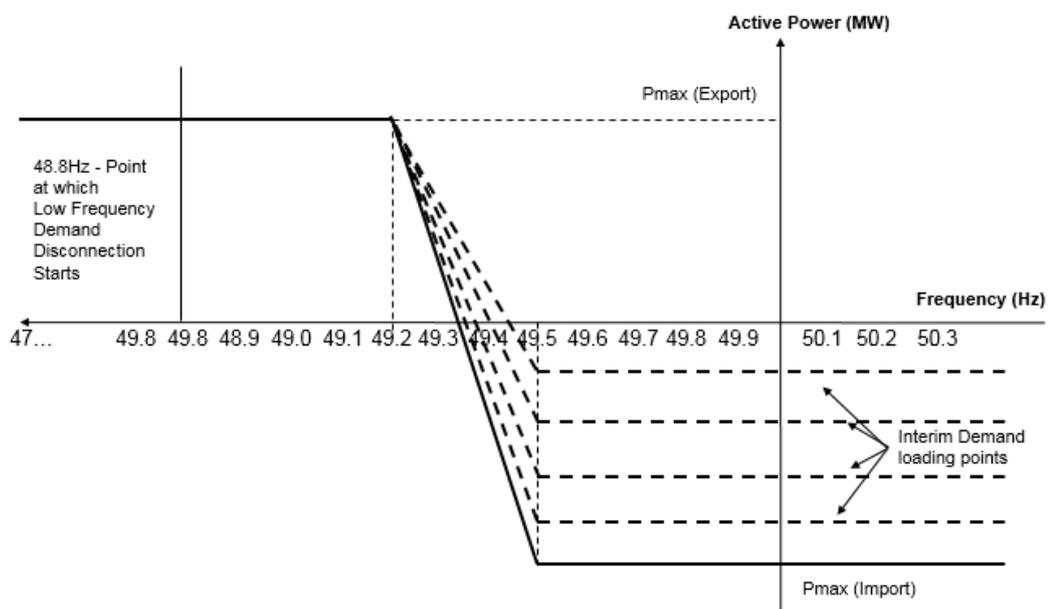


Figure 1.0

As noted above, Article 15(3) E&R NC does state that the TSO shall set the time limit and active power set point for switching from an importing mode of operation to an exporting mode of operation. In GB, by setting the switching time to a short interval (1µs) the default option as defined in Article 15(3)(b) of the E&R NC would be for the automatic disconnection to take place. As GB System Operator, National Grid ESO would not wish all Storage plants to trip at the same time so the specific settings would be included within the Bilateral Agreement which would be consistent with the approach adopted for Pumped Storage.

### **Active Power Requirements on SGUs**

E&R NC Article 21 (1b) states that:

*In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints.*

Clause 4.6.3 of SDP has been re-drafted to state:

*“Under the EU NCER, the NGESO shall be entitled to request assistance for active power from a CUSC Party which does not already provide a balancing service. For the avoidance of doubt this would not extend to an Embedded Power Station unless the owner of that Power Station (i.e. the Generator) has a CUSC Contract with the NGESO”.*

The Proposer has since looked at this in further detail and believes the confusion relates to the definition of an SGU in the E&R NC. In GB, the term SGU is not used and clarity is required in how an SGU is defined within the GB arena. This issue is covered in Section 5 of this report. In considering this issue, the general approach is that an SGU for the purposes of the System Defence Plan would be any GB party who is either a User or a Balancing Mechanism (BM) Participant and therefore bound by the requirements of the Grid Code OC's and BC's. A party who falls outside of this criteria would not be able to be instructed or satisfy the requirements of the System Defence Plan and hence would not be deemed to be a SGU. As such, the Proposer has taken the opportunity to update the System Defence and System Restoration Plan (Appendix B of both documents) so it is clear what an 'SGU', 'Defence Service Provider' and 'Restoration Service Provider' is and how this relates to GB Parties. The intention here is to clearly define which GB Parties would be within the scope of E&R NC.

### **Compliance Testing for Demand Facilities Providing Demand Side Response (Article 45)**

E&R NC states that:

*“1. Each defence service provider delivering demand response shall execute a demand modification test, after two consecutive unsuccessful responses in real operation or at least every year, following the methodology laid down in Article 41(1) of Regulation (EU) 2016/1388.*

2. *Each defence service provider delivering demand response low frequency demand disconnection shall execute a low frequency demand disconnection test within a period to be defined at national level and following the methodology laid down in Article 37(4) of Regulation (EU) 2016/1388 for transmission connected demand facilities or according to a similar methodology defined by the relevant system operator for other demand facilities”*

To address this issue, the Demand Response Services Code in the GB Grid Code would be updated, with this Modification, to read:

*”DRSC.11.7 Additional Testing requirements for Non-Embedded Customers and CUSC Parties who are also Demand Response Providers*

*DRSC.11.7.1 Non-Embedded Customers and CUSC Parties who are also Demand Response Providers shall be required to execute a demand modification test after two consecutive unsuccessful responses in the operational environment or at least every year as agreed with The Company.*

*DRSC.11.7.2 Each Non-Embedded Customer and CUSC Party who are also Demand Response Providers and provide demand response low frequency demand disconnection shall execute a low frequency demand disconnection test at least once every three years”.*

For GB, the Low Frequency Demand Disconnection test has been set at once every three years to ensure consistency with the frequency of Black Start testing.

In addition, where a re-test is required under OC5, the Table in OC5.5.4 would also be updated, with this Modification, to include an entry for Demand Response.

## **Compliance Testing for Low Frequency Demand Disconnection Relays (Article 47)**

E&R NC states that:

*“Each DSO and TSO shall execute testing on the low frequency demand disconnection relays implemented on its installations, within a period to be defined at national level and following the methodology laid down in Article 37(6) and Article 39(5) of Regulation (EU) 2016/1388”.*

To address this issue, the European Compliance Processes in the GB Grid Code would be updated, with this Modification, to read:-

*“ECC.A.5.4 Low Frequency Relay Testing*

*---*

*ECC.A.5.4.2 Each Non-Embedded Customer shall aim to execute testing on its low frequency demand disconnection relays installed within its network and in service at least once every three years, although this may be extended to no more than every five years if considered to be required for operational purposes.*

**ECC.A.5.4.3 Each Network Operator and Relevant Transmission Licensee shall aim to execute testing on its low frequency demand disconnection relays installed within its network and in service at least once every three years, although this may be extended to no more than every five years if considered to be required for operational purposes.**

For existing installations, the same requirements have already been added to CC.A.5.4.2 and CC.A.5.4.3 of the Grid Code.

## **GC0128**

### **Frequency management within a Black Start (Article 27(4))**

The majority of changes are based on the Frequency Management Procedure in the SRP (section 3.3). The main issue here is that in GB NGSO generally takes on the role as overall co-ordinator of the restoration procedure and is considered to be the 'Frequency Leader'. However, the two Transmission Licensees in Scotland do have a role in frequency management under STCP06-1 (Black Start) and on this basis sections 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the System Restoration Plan has been updated to reflect this.

### **Information Exchange (Article 40)**

Article 40 of E&R NC refers to information being exchanged during a Emergency, Blackout or Restoration State. The Grid Code already contains provisions for the sharing of information under a whole range of conditions, including Blackouts and Emergencies.

### **Quick Re-Synchronisation (Article 44(2))**

E&R NC states that:

*"2. Each restoration service provider which is a power generating module delivering a quick re-synchronisation service shall execute tripping to houseload test after any changes of equipment having an impact on its houseload operation capability, or after two unsuccessful consecutive tripping in real operation, following the methodology laid down in Article 45(6) of Regulation (EU) 2016/631".*

To address this issue OC5.7 would be updated, with this Modification, to read:

**OC5.7**            **BLACK START TESTING**

**OC5.7.1**        **General**

- (a) The Company shall require a Black Start Service Provider to carry out a Black Start Test in order to demonstrate that a Black Start Station or Black Start HVDC System has a Black Start Capability.**
  - (i) In the case of a Generator, The Company shall require a Generator with a Black Start Station to carry out a test (either a "Black Start Unit Test or a Black Start Station Test") in order to demonstrate that a Black Start Station has a Black Start Capability.**

- (ii) In the case of an **HVDC System Owner** or **DC Converter Station Owner**, **The Company** shall require an **HVDC System Owner** or **DC Converter Station Owner** with a **Black Start HVDC System** to carry out a test (a "**Black Start HVDC Test**") on a **HVDC System** or **DC Converter**, in order to demonstrate that a **Black Start HVDC System** has a **Black Start Capability**.
  - (iii) In the case of an **EU Generator**, **The Company** may also require a **Generator** with a **Black Start Station** to carry out a test (a **Quick Resynchronisation Unit Test**) in order to demonstrate that a **Black Start Station** has a **Quick Re-Synchronisation Capability**.
- (b) Where **The Company** requires a **Black Start Service Provider** to undertake testing, the following requirements shall apply:-
- (i) Where **The Company** requires a **Generator** with a **Black Start Station** to carry out a **Black Start Unit Test**, on each **Genset**, which has **Black Start Capability**, within such a **Black Start Station**, the **Generator** shall execute such a test at least once every three years. **The Company** shall not require the **Black Start Test Unit** to be carried out on more than one **Genset** at that **Black Start Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Gensets** at the **Black Start Station** to be directly affected by the **Black Start Unit Test**.
  - (ii) **The Company** may occasionally require the **Generator** to carry out a **Black Start Station Test** at any time (but will not require a **Black Start Station Test** to be carried out more than once in every three calendar years in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful, this **Black Start Station Test** shall count as a successful **Black Start Unit Test** for the **Genset** used in the test.
  - (iii) **The Company** may require the **HVDC System Owner** or **DC Converter Station Owner** to carry out a **Black Start HVDC Test** at any time (but will not require such a test to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).
  - (iv) **The Company** may occasionally require the **EU Generator** to carry out a **Quick Re-Synchronisation Test** at any time, but will generally only be required where the **EU Generator** has made a change to its **Plant** and **Apparatus** which has an impact on its **Houseload Operation** or after two unsuccessful tripping **Events** in the operational environment.

The above tests will be deemed a success where starting from **Shutdown** is achieved within a time frame specified by **The Company** and which may be agreed in the **Black Start Contract**.

- c) **The Company** may require a **Generator** to carry out a **Black Start Unit Test** at any time (but will not require a **Black Start Unit Test** to be carried out more than once in each calendar year in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).
- (d) When **The Company** wishes a **Black Start Service Provider** to carry out a **Black Start Test**, it shall notify the relevant **Black Start Service Provider** at least 7 days prior to the time of the **Black Start Test** with details of the proposed **Black Start Test**.

- (a) The relevant **Generating Unit** shall be **Synchronised and Loaded**;
- (b) All the **Auxiliary Gas Turbines** and/or **Auxiliary Diesel Engines** in the **Black Start Station** in which that **Generating Unit** is situated, shall be **Shutdown**.
- (c) The **Generating Unit** shall tripped to house load.
- (d) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** under **BC2** which would also be in accordance with the requirements of the **Black Start Contract**.

*In respect of **EU Generators**, the above tests defined in OC5.7.2.3(a) – (e) shall be in accordance with the requirements of ECC.6.3.5.6.*

## General Updates applicable to GC0127 and GC0128

As part of the implementation of E&R NC into the GB there are number of elements which are common to both GC0127 and GC0128. In general these refer to requirements such as communication facilities and testing. Whilst the majority of requirements of E&R NC are already generally covered in the Grid Code, a few updates to the Grid Code legal text are proposed to align with the E&R NC. These elements have been introduced following the mapping process which translates the requirements in the E&R NC into the GB framework.

### Backup Power Supplies for Communication Systems (Article 48(2))

E&R NC states that:

*“Each DSO and SGU identified pursuant to Article 23(4), each TSO and restoration service provider shall test the backup power supply of their communication systems at least every five years”.*

To address this issue CC.6.5.4.4 and EC.6.5.4.4 of the Grid Code would be updated, with this Modification. As an example and in the case of ECC.6.5.4.4 the additional text included is replicated below with similar text applying for CC.6.5.4.4.

*“ECC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). **The User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. **The Company** requires the **EU Code User** to test the backup power supplies feeding its **Control Telephony** facilities at least once every 5 years”.*

## 4 Impacts & Other Considerations

### GC0127

Under the proposals for GC0096 (Storage) owners of storage facilities will be treated as if they were Generators. It is therefore suggested that anyone who owns and/or operate storage equipment who are caught by the requirements of the GC0096 proposals would

also be affected by this Modification as their equipment would be treated as an SGU. In addition, BM parties (including Aggregators) who are caught by the requirements of the Grid Code, would also be considered to be within the scope of these GC0127 proposals.

### **GC0128**

Black Start Service Providers (a term introduced through the GC0125 proposals) will be affected by this GC0128 modification as will SGUs.

### **Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?**

No.

### **Consumer Impacts**

This change will facilitate the implementation of the E&R NC which helps to facilitate a harmonised electricity system as part of the package of European Network Codes, and will help to deliver and facilitate significant benefits to the end consumer by ensuring a coordinated security of supply across GB and Europe.

### **Costs**

<b>Code administration costs</b>	
Resource costs	<b>£12,705</b> - 7 Workgroup meetings <b>£291</b> - Catering
Total Code Administrator costs	<b>£12,996</b>

<b>Industry costs (Standard CMP)</b>	
Resource costs	<b>£38,115</b> - 7 Workgroup meetings <b>£12,705</b> – 2 Consultations <ul style="list-style-type: none"> <li>• 7 Workgroup meetings</li> <li>• 6 Workgroup members</li> <li>• 1.5 man days effort per meeting</li> <li>• 1.5 man days effort per consultation response</li> <li>• 7 consultation respondents</li> </ul>
Total Industry costs	<b>£50,820</b>
Total	<b>£63,816</b>

## 5 Workgroup discussions prior to issue of Workgroup Consultation

The Workgroup convened on seven occasions between 29 May 2019 and 28 August 2019 to discuss the proposal, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Grid Code Objectives.

The Workgroup discussed a number of the key attributes under GC0127 and GC0128, these discussions are described below. The Workgroup for GC0127 and GC0128 met and discussed both Modifications due to having the same membership and similar themes in discussion areas. These modifications were amalgamated at the July 2019 Grid Code Review Panel meeting.

### **Significant Grid Users**

Some Workgroup members highlighted that it was difficult for them to understand whether they were or were not a 'SGU' by using the proposed criteria outlined in Appendix A and B of the SDP and SRP respectively and that there should, according to Articles 11(4)(c) and 23(4)(c), have (1) been a list of SGUs produced by National Grid ESO (and submitted to the NRA) for them to check whether they were on it; and (2) the SGUs notified by National Grid ESO (or the DSO, if applicable) of the fact that they meet the criteria and therefore are considered to be a SGU for the purposes of E&R NC in GB.

The Proposer stated that they have updated the System Defence and System Restoration Plan, including Appendix B and the Glossary and Definitions so it is clear in GB what is defined as a Defence Service Provider, Restoration Service Provider and Significant Grid User for the purposes of E&R NC. According to the Proposer Appendix B of both Plans have been updated and this defines what an SGU in GB is considered to be and the measures required. The Proposer advised that it is not practical to provide a list of individual parties but a criteria clearly articulating who would be within the scope of E&R NC. In addition, National Grid ESO will also be notifying those parties, in the near future<sup>2</sup>, that they fall within the scope of E&R NC and therefore that they are an SGU. A Workgroup member noted that TSOs in other Member States had provided such a list of SGUs, confidentially, to their NRA and taken steps to comply with the December 2018 deadline for notifying those SGUs accordingly.

### **Significant Grid Users within scope of GB**

The Proposer confirmed their view that the following would be deemed to be a SGU in GB;

- *Generators who own and operate new and existing Power Generating Modules (i.e. pre-and post RfG) at Large Power Stations or any Generator who owns and operates new and existing Power Generating Modules at a Power Station which is directly connected to the Transmission System or a Generator who has a CUSC contract with National Grid ESO;*

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<sup>2</sup> National Grid ESO outlined to the Workgroup that they were intending to issue these notifications over the summer of 2019.

- *HVDC System Owners and DC Converter Station Owners who are signatories to the CUSC and required to satisfy the requirements of the Grid Code;*
- *New and Existing Non-Embedded Customers (Transmission Connected Demand Facilities);*
- *New and Existing Transmission Connected Closed Distribution Systems; and*
- *Virtual Lead Parties who have signed a CUSC contract with National Grid ESO.*

It was noted that this was not consistent with what had been published and submitted by National Grid ESO to Ofgem in December 2018. The Proposer does however fully recognise that it is not clear what actually constitutes an SGU, especially as this term has derived itself from within the framework of the EU Network Codes rather than existing terminology which has used within GB. However, Workgroup members noted that there must; for the purposes of compliance and assurance; be absolute clarity of who is (and who, therefore, is not) a SGU for the purposes of the TSOs, DSOs and SGUs to ensure GB compliance with E&R NC, as the legal requirements centre around 'SGUs';

The Proposer stated to the Workgroup that they are fully committed to clarifying the definition of an SGU, Defence Service Provider and Restoration Service Provider and therefore substantial updates have been made to Appendix A, Appendix B, and the Glossary and Definitions of the SDP and SRP issued on 10<sup>th</sup> July 2019 for public consultation;

In general, the approach proposed is that Appendix B of the System Defence and System Restoration Plan defines what a SGU in GB is (i.e. a GBSGU). A Defence Service Provider has the same meaning as a SGU in GB and a Restoration Service Provider is a Black Start Service Provider and / or a GB SGU. In addition, the list in Appendix B now includes the measures that are incumbent on GB SGU's;

An extract from the proposed wording in Appendix B of the SRP and SDP is reproduced in Table 1.0 below to give GB stakeholders this clarity;

The Proposer sought Legal advice; however, in assessing the E&R NC, in particular Articles 2, 4, 11.4(c) and 23.4(c) (which are reproduced at the end of this section), they have come to the above view on the basis that Articles 11.4(c) and Articles 23.4(c) require the System Defence Plan and System Restoration Plan to provide a list of SGU's responsible for implementing on their installations, the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631 (Requirements for Generators), Regulation (EU) 2016/1388 (Demand Connection Code) and Regulation (EU) 2016/1447 (HVDC Code) or from National Legislation and a list of measures to be implemented by those SGU's. The Proposer firstly noted i) that the requirements of the EU Connection Network Codes only applies to new parties ii) it also considers that there is some scope for defining the list of SGU's through Articles 11.4(c) and Articles 23.4(c) and iii) there would be significant cost to non CUSC Parties and BM Parties, in particular those who are existing, should the SGU cover all permutations and combinations as defined in Article 2. To this end, the Proposer has tried hard to clearly define (though amendments to the System Defence Plan and System Restoration Plan) what an SGU within GB is and how the criteria within Article 2 of E&R NC relates to those parties; and

On the other hand, one Workgroup member considered that the definitions of an 'SGU', a 'System Defence Provider' and a 'System Restoration Provider' within E&R NC is, in

their view, much wider than that suggested by the Proposer and that this was in order to ensure that the system is secure from events which could endanger the security of the system and, in the event of a blackout, support the speedy restoration of the system and thus electricity supplies to end consumers. The Workgroup member noted, for example, that taking into account National Grid ESO's Interim Report into 9 August 2019 event that limiting System Defence Providers / SGUs to just those parties with a CUSC contract with National Grid ESO would be limiting the ability for National Grid ESO to call upon other providers which were envisaged within E&R NC to be used to help maintain system security; such as Type B generators (Article 2(2)(b)) and re-dispatchers of power generating modules and demand facilities (Article 2(2)(e)), if a similar emergency situation arose on the system.

Table B1 below (which was prepared by the Proposer and updated 22 August 2019) details which GB Parties would, according to National Grid ESO, be within the scope of E&R NC.

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
Existing and new Power Generating modules classified as Type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631	New	Any Generator who is an EU Code User who has a CUSC Contract with the NGESO and owns or operates a Type C or Type D Power Generating Module	<p>Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Type C or Type D Power Generating Module would meet one or more of the requirements of the System Defence Plan.</p>	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.
	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the NGESO	<p>Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>Generators with a CUSC Contract would need to comply with the applicable requirements of the Grid Code and in doing so would satisfy one or more measures of the System Defence Plan.</p>	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
Existing and new power generating modules classified as Type B in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, where they are identified as SGU's in accordance with Article 11(4)	New	Any Generator who is a EU Code User and has a CUSC Contract with the NGESO and owns or operates a Type B Power Generating Module	<p>Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type B Power Generating Module would meet one or more of the requirements of the System Defence Plan.</p>	<p>As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of EU NCER.</p> <p>BC 3* applies to Large Power Stations and directly connected Power Stations.</p>
	Existing	Any Generator who is a GB Code User and who has a CUSC Contract with the NGESO	<p>Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.</p>	<p>As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER.</p> <p>BC 3* applies to Large Power Stations and directly connected Power Stations.</p>
Existing and new Transmission-connected demand	New	Any Non-Embedded Customer who is an	<p>Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2,</p>	<p>BC 3* and the DRSC* would also apply if the Non-Embedded Customer provided Ancillary Services.</p>

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
facilities		EU Code User and who has a CUSC Contract with the NGESO	BC3*, DRC  In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	
	Existing	Any Non-Embedded Customer who is a GB Code User and has a CUSC Contract with the NGESO	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC  In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	BC 3 would apply if the Non-Embedded Customer provided Ancillary Services.
Existing and new Transmission Connected Closed Distribution Systems	New	Any Non-Embedded Customer who is an EU Code User and who has a CUSC Contract with the NGESO	Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC  In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO. The DRSC and BC3 would apply if the Non-Embedded Customer provided Ancillary Services.

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
	Existing	Any Non-Embedded Customer who is a GB Code User and which has a CUSC Contract with the NGESO	<p>Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.</p>	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO
Providers of redispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation 2017/1485	New & Existing	Virtual Lead Party with a CUSC Contract	(ECC/CC 6.5 only) DRSC*, BC1, BC2, BC3*	<p>In general a Virtual Lead Party with a CUSC Contract will also be a User and in this case they would be caught by the requirements of NCER. Users can fall into different categories and these are detailed above.</p> <p>A Virtual Lead Party with a CUSC Contract who is not defined as a User (such as an Aggregator) will have to satisfy the requirements of BC1 and BC2 and ECC/CC.6.5, and therefore would be considered to meet one or more requirements under the System Defence Plan.</p> <p>A Virtual Lead Party with a CUSC Contract who also satisfies the requirements of the DRSC (ie they offer Ancillary Services and caught by the requirements of DCC (ie EU Code User's) may also have to satisfy the requirements of BC3 but this would depend on the type of Ancillary Service offered.</p>

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
				In all cases a Virtual Lead Party with a CUSC Contract would be treated as having to meet the requirements of NCER.
Existing and new high voltage direct current (HVDC) Systems and direct current connected Power Park Modules in accordance with the criteria set out in Article 4(1) of commission Regulation (EU) 2016/1447	New	HVDC System Owners and Generators in respect of Transmission DC Converters and/or DC Connected Power Park Modules who are EU Code Users and have a CUSC Contract with the NGESO	<p>Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, HVDC System Owners and Generators in respect of DC Connected Power Park Modules with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.</p>	BC 3* applies to HVDC System Owners. The requirements for LFSM-O for HVDC Systems and DC Connected Power Park Modules are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
	Existing	DC Converter Station Owners and Generators in respect of Transmission DC Converters who are GB Code Users and have a CUSC Contract with the NGESO	<p>Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, DC Converter Station Owners with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.</p>	BC 3* applies to DC Converter Station Owners

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
<p>Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify as defence service providers pursuant to Article 4(4)</p>	<p>New</p>	<p>Any Generator who is an EU Code User and has a CUSC Contract with the NGENSO and owns or operates a Type A Power Generating Module.</p> <p>Non Embedded Customers and Virtual Lead Parties with a CUSC Contract in respect of Closed Distribution Systems and Aggregators.</p>	<p>Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type A Power Generating Module would meet one or more of the requirements of the System Defence Plan in the same way as a Generator who owns or operates a Type B Power Generating Module</p>	<p>As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER.</p> <p>BC 3* applies to Large Power Stations and directly connected Power Stations. Type A Power Generating Modules are required to satisfy the requirements of ECC.6.3.7.1 (LFSM-O).</p>

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
<p>Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify as defence service providers pursuant to Article 4(4)</p>	<p>Existing</p>	<p>Any Generator Registered as a GB Code User which has a CUSC Contract with the NGENSO and owns or operates a Generating Unit or Power Park Module and is required to satisfy the requirements of the Grid Code</p> <p>Non-Embedded Customers and Virtual Lead Parties with a CUSC Contract in respect of Closed Distribution Systems and Aggregators.</p>	<p>Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p> <p>In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.</p>	<p>As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER.</p> <p>BC 3* applies to Large Power Stations and directly connected Power Stations.</p>

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
<p>Type A and Type B Power Generating Modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or indirectly through a third party under the terms and conditions set out in accordance with Article 4(4)</p>	<p>New and Existing</p>	<p>Virtual Lead Party with a CUSC Contract</p>	<p>BC1, BC2,(ECC/CC.6.5 applies only)</p>	<p>This is a non-mandatory requirement.</p> <p>If a Virtual Lead Party with a CUSC Contract owns or operates a Type A or Type B Power Generating Module, this would fall under the requirements of RfG. They would also need to comply with the requirements of BC1 and BC2 and therefore fall under the scope of NCER. If the party is also a EU Code User, the wider requirements of the Grid Code would apply (ie ECC's ,ECP's and OC's would also apply in which case they would also considered to be within the scope of NCER.</p> <p>If an existing Virtual Lead Party with a CUSC Contract owns or operates a Small Power Station they would need to meet the requirements of BC, BC2 and CC.6.5. They would be treated as being within the scope of NCER.</p> <p>If an Aggregator registered as a Virtual Lead Party with a CUSC Contract has generation and/or demand and required to meet the requirements of the applicable Balancing Codes this would also fall under the requirements of NCER</p>
<p>This Regulation shall apply to energy storage units of a SGU, a defence service provider or</p>	<p>New</p>	<p>Any EU Code Generator which has a CUSC Contract with the NGESO and which owns and operates</p>	<p>Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6 (in particular OC6.6), OC7, OC10, OC12, BC1, BC2, BC3*, DRC</p>	<p>Under the GC0096 proposals, when a Storage Plant is in an importing mode of operation, and the System Frequency falls automatic tripping is required in accordance with the requirements of OC6.6.</p> <p>Within GB, the capability to switch from import to export during low system frequency conditions is not required. Tripping will be initiated prior to the start of Low Frequency Demand Disconnection which</p>

EU Criteria	New or Existing	GB Parties within scope of EU NCER	Measures of the System Defence Plan	Comments
restoration service provider which can be used to balance the system, provided that they are identified as such in the system defence plans restoration plans or service contract.		Electricity Storage Modules would be classified as a Storage User as defined under the GC0096 Grid Code proposals	Under the GC0096 proposals, Electricity Storage Modules are treated in the same way as Power Generating Modules. Generators who have a CUSC Contract with the NGENSO who own and/or operate Electricity Storage Modules would therefore be within the scope of NCER.	occurs at 48.8Hz.  All the other requirements of the Grid Code apply and therefore Storage Units caught under the proposed requirements of GC0096 would be considered to be within the scope of NCER.
	Existing	Any CUSC Party who owns or operates Storage plant	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC	A CUSC Party owning a Storage plant would be required to satisfy the requirements of the Grid Code and hence would be considered to be within the scope of NCER.  The technical requirements applicable to the storage plant including the ability to trip during low system frequencies will be as specified in the Bilateral Agreement.

Table 1.0

In addition, it is also very important to clarify those GB parties who would fall outside the scope of E&R NC and hence those parties who would not be classified as a SGU within GB, and therefore not have to comply with the requirements of E&R NC. These are also clarified in Appendix B of the System Defence and System Restoration Plan and reproduced below.

- *Any Embedded Generator in respect of a Medium or Small Power Station which does not have a CUSC Contract the NGENSO<sup>3</sup> including a Licence Exempt Embedded Medium Power Station (LEEMPS)*
- *A Demand Response Provider who does not have a CUSC Contract with the ESO*
- *Any HVDC System Owner or DC Converter Station Owner or Generator who owns and operates an HVDC System or DC Converter Station or Transmission DC Converter or DC Connected Power Park Module which does not have a CUSC Contract or Interconnector Agreement with the ESO*

*For the avoidance of doubt, the National Grid ESO, Transmission Licensees and Distribution Network Operators are not classified as Significant Grid Users (SGU) though they are required to satisfy the requirements of the NCER.*

### **Notification**

Some Workgroup members; noting the requirements in Articles 12 (3)-(5) and 24 (3)-(5) about notifications being issued by 18 December 2018; stated that they had not been notified by National Grid ESO (or DSO, if applicable) of the fact that they are an SGU in the manner required by the E&R NC. The Proposer stated that, in their view, they had notified SGUs that they were captured by publishing the SDP and the SRP with the criteria outlined in Annex A on the National Grid ESO website. A Workgroup member highlighted that if the E&R NC had meant for this notification action to be completed in this way it would have stated for it to be published on the website as it does in some other areas of the Network Codes and therefore, this was not, in their view, the intent of the word 'notification' in E&R NC. The Workgroup member expanded to state that notification maybe considered by National Grid ESO to be onerous but if this is what is required by EU law this is what should happen or have happened. An example of another notification was highlighted in Article 24(6) (b) in terms of how the SGUs have implemented and maintained the measures required.

The initial view of the Proposer was to publish an Open Letter to fulfil this obligation on National Grid ESO to notify where potential SGUs could themselves self-determine whether they were an SGU. Workgroup members did not feel that this would sufficiently fulfil the National Grid ESO's (or, if relevant, DSO's) obligation to notify. Workgroup members also noted that if they were notified of being an SGU that they would have a further twelve months from the date of the notification to implement their obligations.

It was additionally highlighted that it is not just the Transmission System Operator that is obligated to carry out the notification to SGUs but that the Distribution System Operators also need to carry out some of the notifications to SGUs. Some Workgroup members also discussed that even if they had new obligations outlined in the Grid Code that if they had not been notified, according to E&R NC, that they would not have to comply with

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<sup>3</sup> National Grid ESO.

them as a result as the Grid Code changes for E&R NC purposes (as per GC0127 and GC0128) were applicable to SGUs.

The Proposer outlined that as they have a two-stage approach to the implementation of the E&R NC (i.e. those requirements to be in place by 18 December 2019 and those to be in place by 18 December 2022) that there would have to be two notifications to SGUs on any new obligations when they have been fully developed within the Grid Code modifications required.

The Proposer acknowledged there were two issues here. The first was the definition of an SGU which has been clarified through Appendix B of the SDP and SRP issued by National Grid ESO for public consultation on 10<sup>th</sup> July 2019. The second is how would a GB party who is within the scope of E&R NC be notified that they were an SGU. On the basis that stakeholders considered an Open Letter not to be sufficient at the last meeting, the Proposer agreed to take this issue away and consider a more appropriate solution.

The Proposer subsequently clarified to the Workgroup that they would be sending a notification letter to each SGU, Defence Service Provider and/or Restoration Service Provider as applicable. A Workgroup member questioned whether this would detail all of the measures required to be implemented by the SGU; as per the requirements in Articles 12 (3)-(5) and 24 (3)-(5). The Proposer stated that the revised System Defence and System Restoration Plan included these measures. A Workgroup member stated that they believe that when the E&R NC was drafted that the intention of it was for it to be clear to each SGU what measure(s) they needed to undertake and by when. The Proposer noted that with the proposed approach set out in Appendix A and B of the SDP and SRP that if the party does not have a CUSC contact with the National Grid ESO or they are not a BM Participant, then there would be significant costs for those parties if they were classified as an 'SGU'. If non-CUSC or non-BM participating parties were defined as 'SGUs' then the cost of instructing such parties would not be insignificant.

However, a Workgroup member noted that the scope of E&R NC, as set out in Article 2, did extend to Type B (1MW plus) generation and could, as per Article 2(3), extend to Type A (800W plus) generation at both transmission and distribution as well as re-dispatchers of power generating modules and demand facilities. The Workgroup member referred to National Grid ESO's Interim Report into 9 August 2019 event and was concerned, in the context of maintaining system security, that limiting System Defence Providers / SGUs to just those parties with a CUSC contract would be limiting the ability for National Grid ESO to call upon other providers which were envisaged within E&R NC to be used; such as Type B generators (Article 2(2)(b)) and re-dispatchers of power generating modules and demand facilities (Article 2(2)(e)); if a similar emergency situation arose on the system.

In response, the Proposer reiterated their view of the treatment of a SGU, Defence Service Provider and Restoration Service Provider as discussed in the earlier section titled Significant Grid Users in GB. The Proposer is fully aware that a Workgroup member may raise a "potential Alternative" with regard to this Interpretation.

### ***Updates to the System Defence and System Restoration plans following Ofgem approval and link to GC0127 and GC0128***

The Proposer highlighted to the Workgroup within their proposed solution for GC0127 and GC0128 that the position outlined does not match what had been published by

National Grid ESO in the System Defence Plan and the System Restoration Plan submitted to Ofgem on 18 December 2018. It was noted that Ofgem had; in their letter<sup>4</sup> of 21<sup>st</sup> June 2019, requested amendments to the two Plans submitted in December 2018 and as a consequence the System Defence Plan and System Restoration Plan had been substantially updated by National Grid ESO and released for consultation<sup>5</sup>. The timetable for these two Plans is as follows:

Stage	Date
<b>Submission of the SDP and SRP to Ofgem</b>	18/12/2018
<b>Request for amendment from Ofgem</b>	w/c 17/06/2019
<b>Electricity System Operator/Transmission System Operator to consult on amendments</b>	Consultation opened on 10 July 2019
<b>Resubmission of the SDP and SRP to Ofgem</b>	By 18/08/2019
<b>Ofgem decision on whether to approve the SDP and SRP</b>	Two months following re-submission – around 18 October 2019

The Workgroup concluded that it would be most efficient and pragmatic to carry out this Workgroup Consultation at the same time as the National Grid ESO July Consultation on the amendments to the SDP and SRP.

### **Definitions**

The Proposer outlined their position with regard to the proposed definitions, for the purposes of GC0127 and GC0128, below;

Definition	Meaning
Defence Service Provider	A Defence Service Provider is a legal entity with a legal or contractual obligation to provide a service contributing to one or several measures of the System

<sup>4</sup> [https://www.ofgem.gov.uk/publications-and-updates/request-amendment-electricity-system-operator-s-proposal-under-eu-emergency-and-restoration-network-code?utm\\_medium=email&utm\\_source=dotMailer&utm\\_campaign=Daily-Alert\\_21-06-2019&utm\\_content=Request+for+amendment+to+the+Electricity+System+Operator%e2%80%99s+proposal+under+the+EU+Emergency+and+Restoration+Network+Code&dm\\_i=1QCB,6CHYE,UWA0T7,P3CJO,1](https://www.ofgem.gov.uk/publications-and-updates/request-amendment-electricity-system-operator-s-proposal-under-eu-emergency-and-restoration-network-code?utm_medium=email&utm_source=dotMailer&utm_campaign=Daily-Alert_21-06-2019&utm_content=Request+for+amendment+to+the+Electricity+System+Operator%e2%80%99s+proposal+under+the+EU+Emergency+and+Restoration+Network+Code&dm_i=1QCB,6CHYE,UWA0T7,P3CJO,1)

<sup>5</sup> <https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open>

	Defence Plan. In GB, a Defence Service Provider has the same meaning as a GB Significant Grid User (GB SGU)
Restoration Service Provider	A restoration service provider refers to “a legal entity with a legal or contractual obligation (including a Black Start Service Provider) to provide a service contributing to one or several measures of the restoration plan”. In GB, a Restoration Service Provider is a GB Significant Grid User (GB SGU) and/or a Black Start Service Provider.

**GC0127 Article specific discussions**

E&R NC Articles covered in this modification:

<b>Article 15(3) Automatic under frequency control</b>
<b>Article 21(1)(b) Assistance for active power</b>
<b>Article 45 Compliance testing</b>
<b>Article 47, Compliance testing of low frequency demand disconnection relays</b>

***Article 15(3) and (4) Automatic under frequency control***

The Proposer stated that this would be one of the main amendments required to the Grid Code as a result of the SDP. It was noted that there is a requirement for storage units to automatically switch from demand mode to generation mode and that this had not been covered as part of the ongoing modification to the Grid Code on Storage (GC0096). As noted above the Proposer now believes this issue has been addressed through the approach detailed in Section 3 of this document.

A Workgroup member referred to the ESO’s Interim Report into 9<sup>th</sup> August 2019 event and was concerned, in the context of maintaining system security, that circa 1,800MW of existing distribution connected energy storage appeared not to have played a role in system defence in the way envisaged in Article 15(3). The Workgroup member, in their opinion, suggested that if the Article 15(3) requirements had been fully applied to existing

(and, going forward, new) energy storage in GB that some (or all<sup>6</sup>?) of the LFDD activation on 9<sup>th</sup> August 2019 could possibly have been avoided.

### **Article 21(1)(b) Assistance for active power**

The Workgroup concluded that no extra requirements were needed in the Grid Code as a result of this Article as the Proposer stated this was already required of GB parties caught by the existing requirements of the Grid Code.

### **Test Plan and Article 43**

A Workgroup member questioned where the test plan was, as required in Article 43 (2) of the E&R NC which states that:

*“By 18 December 2019 each TSO shall define a test plan in consultation with the DSOs, the SGUs identified pursuant to Articles 11(4) and 23(4), the defence service providers and the restoration service providers. The test plan shall identify the equipment and capabilities relevant for the system defence plan and the restoration plan that have to be tested.”*

The Workgroup member stated that a test plan was required to be developed by National Grid ESO, in consultation with DSOs and SGUs. The Proposer stated that there would be testing requirements outlined for Article 44-47. To address this concern amendments have been proposed to be introduced to the Grid Code (via GC0127 and GG0128) in respect of Articles 44, 45 and 47 as noted above in Section 3. In the view of the Proposer there is no requirement for amendments in respect of Article 46 as these are already covered by the proposals under consideration as part of the GC0125 Modification. However, the Proposer wasn't able to clarify when the consultation, with affected stakeholders and the wider industry, on the test plan required by Article 43(2) will be undertaken.

### **Article 47**

The Proposer outlined that this was around protection and they required some more information on how this is completed. A Workgroup member took away an action to look into this and provide this to the Workgroup. Additional amendments have also been proposed to be introduced to the Grid Code via GC0127 and GC0128 as noted in Section 3 above as part of this requirement.

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<sup>6</sup> The Workgroup member noted that the ESO's Interim Report identified that circa 475MW of storage (broadly equating to the circa 500MW of embedded generation that came off prior to LFDD activation) appeared to have been utilised during the event, but after the LFDD was activated.

## **Other**

A Workgroup member noted that in their view there also need a for a dedicated testing procedure as a result of Article 51 (2) which states that:

*“In addition, where deemed necessary by the TSO for the effectiveness of the restoration plan, each TSO shall execute operational testing of parts of the restoration plan, in coordination with the DSOs identified pursuant to Article 23(4) and the restoration service providers. The TSO shall set out, in consultation with the DSOs and restoration service providers, those operational tests in a dedicated testing procedure.”*

The Workgroup member noted that the testing procedure would need to be prepared in consultation with DSOs and SGUs and that the operational testing would be executed by the TSO after coordination with the DSOs and SGUs. The Workgroup noted this and agreed to develop a solution. The Proposer has added additional commentary to this item in the mapping table noting that internal procedures do exist although agreed that based on the feedback from the GC0127 and GC0128 consultation and further discussions with the ESO Black Start Team, consideration should be given to the preparation of a Test Plan and Test Procedures which will be consulted upon with Stakeholders in the Autumn of 2019.

## **GC0128 Article specific discussions**

### ***Activation of re-energisation procedure Article 27(4)***

#### ***Frequency leader***

It was noted that in respect of Article 27 that the allocation of the functional responsibility of this Article for GB purposes in terms of the re-energisation procedure had been allocated by Ofgem<sup>7</sup> and that this could not be changed. In general, National Grid ESO is responsible for the re-energisation procedure with specific responsibilities defined in STCP 06-1 (Black Start). The Workgroup and the Proposer agree that these responsibilities were not well articulated in the SRP and therefore the Proposer has suggested amendments to sections 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the Grid Code to clarify the situation.

#### ***Is there discrimination and if so how is this justified?***

A Workgroup member questioned why, with the GC0127 and GC0128 proposed solutions there were differences in treatment between Types B, C and D generation within the proposed definition of a SGU in the SRP (and SDP). The Workgroup member requested that the Proposer justify as to why Type B, Type C and Type D generator were being treated differently; i.e. with two identical plant, one would be categorised as a SGU

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<sup>7</sup> <https://www.ofgem.gov.uk/publications-and-updates/minded-decision-assignment-tso-obligations-under-three-eu-network-codes>

(if connected at transmission or embedded with a CUSC contract) and one would not (if connected at distribution but without a CUSC contract).

It was also noted that Embedded Generation which does not have a CUSC contract or is not a BM Participant (i.e. not part of a Virtual Lead Party with a CUSC contract with the ESO) then it is not impacted by the GC0127 or GC0128 Modifications.

The Proposer clarified that this issue is similar to that raised through Grid Code Consultation GC0106 (<https://www.nationalgrideso.com/codes/grid-code/modifications/gc0106-data-exchange-requirements-accordance-regulation-eu-20171485>) which had resulted in the formation of Grid Code Working Group GC0117 <https://www.nationalgrideso.com/codes/grid-code/modifications/gc0117-improving-transparency-and-consistency-access-arrangements> GC0117 seeks to review the definitions of Large, Medium and Small Power Stations in the GB so that Generation across GB (based on size) would have to progress through the same connection process and submit the same data required under the Grid Code. There are similar issues with the treatment of GB Generation so far as the implementation of NCER is concerned. However, a Workgroup member noted that GC0117, if applicable (and approved by Ofgem) would only address part of the discriminatory treatment that arose with the proposed solutions for GC0127 and GC0128 and would not, for example, address the difference in treatment for Type B generators. Workgroup members noted that if GC0117 adopted a threshold between Large and Small Power Stations of 10MW this would automatically include Type C and Type D PGMs within the scope of the Grid Code and hence the requirements of GC0127 and GC0128 would apply to them in the longer term. However, it was noted that there was the potential for other solutions or thresholds to be raised by other Workgroup members which may affect the eventual outcome.

### ***GC0096 Energy Storage modification implications on GC0127 and GC0128***

The Workgroup noted the recent GCRP decision<sup>8</sup> for GC0096 to be sent back to its Workgroup for further work ahead of being submitted to the Authority for decision. They discussed the fact that as these GC0127 and GC0128 Modifications are for compliance for the E&R NC that they should not be reliant on a decision on another Modification (GC0096)

The Code Administrator and Workgroup decided that the best approach would be to 'pull' the GC0096 proposed definitions and related text that would be required for GC0127 and GC0128 to be implemented into those two Modifications. This is related to Article 15(3) of the E&R NC.

Due to this decision and approach adopted the proposed changes that have been lifted from the proposed GC0096 legal text are highlighted in blue in the draft Legal Text for GC0127 and GC0128. This means that if GC0096 does not get approved by the Authority for any reason, or it is sent back for further work, that GC0127 and GC0128 can be fully implemented.

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<sup>8</sup> The decision was made at the 27 June 2019 Grid Code Review Panel meeting.

### ***Storage in the context of GC0127 and GC0128***

The Workgroup also discussed whether existing storage parties should be captured by these two Modifications (for the avoidance of doubt, new storage parties would be captured). The Proposer felt that this should not be the case but also recognised that the E&R NC does apply to both new and existing parties. The updates proposed as part of these two Modifications are generally considered minor. The parties most likely to be affected are those who own and operate existing storage plant with a CUSC contract. Since storage plant is now required to trip when in an import mode of operation and system frequency is low and these conditions are subject to the requirements of the Grid Code (with the individual setpoints detailed in the Bilateral Agreement) it was considered that these requirements are minor. As to the rationale for the treatment of storage this has been clarified in Section 3 above.

A Workgroup member referred to National Grid ESO's Interim Report into 9 August 2019 event and was concerned, in the context of maintaining system security, that circa 1,800MW of existing distribution connected energy storage appeared not to have played a role in system defence in the way envisaged in Article 15(3). The Workgroup member, in their opinion, suggested that if the Article 15(3) requirements had been fully applied to energy storage in GB that some (or all<sup>9</sup>) of the LFDD activation on 9<sup>th</sup> August 2019 could possibly have been avoided. Another Workgroup member noted that Article 2(5) refers to E&R NC applying to Energy Storage Units of SGUs, Defence Service Providers and Restoration Service Providers rather than to all Energy Storage Units.

### ***Balancing Mechanism Participants***

For the avoidance of doubt, BM Participants without a CUSC Contract with National Grid ESO will not be captured by any requirements under GC0127 and GC0128 Original Proposal.

### ***High Priority Significant Grid Users***

The Proposer noted that, as requested by Ofgem in their June 2019 letter, Appendix C of the System Defence Plan and System Restoration Plan have been updated by National Grid ESO in July to now define what a 'High Priority Significant Grid User' is in the context of GB.

The Proposer stated for the purposes of the System Defence Plan a 'High Priority Significant Grid User', as defined in in Appendix C, would be one of the following:

- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or

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<sup>9</sup> The Workgroup member noted that the ESO's Interim Report identified that circa 475MW of storage (broadly equating to the circa 500MW of embedded generation that came off prior to LFDD activation) appeared to have been utilized during the event, but after the LFDD was activated.

- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

The Proposer stated for the purposes of the System Restoration Plan a ‘High Priority Significant Grid User’, as defined in in Appendix C, would be one of the following:

- A Black Start Service Provider; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

A Workgroup member questioned whether the Electricity Supply Emergency Code (ESEC) priority user list of protected sites would be included as High Priority SGUs. The Proposer confirmed that they were not as they were already covered as part of National Legislation. However, a Workgroup member noted that this was not the case as the relevant National Legislation, in the form of ESEC, deals only with planned rota disconnections and not system emergencies, such as those covered by OC6 of the Grid Code.

It was also confirmed that for the purposes of the SDP and SRP Appendix C approach that there are around a thousand such sites in GB that are considered to be High Priority SGUs. A Workgroup member questioned whether these sites had been contacted by National Grid ESO (or the DSOs) to work in co-ordination with them to understand their needs. National Grid ESO stated that they would consider whether the High Priority SGUs should just cover those sites as per Appendix C of the SDP and SRP respectively or whether this should be extended to all Distribution Connected Generators in which case there would be thousands of parties that would have classified as ‘High Priority SGUs; and who would then need to have been contacted to work in co-ordination with National Grid ESO in forming their Restoration and Defence Plans. In relation to this issue National Grid ESO have been in contact with Ofgem after the last Workgroup meeting and the view from Ofgem was that as these sites were already part of National Legislation and there was no need for them to be included in the list of High Priority Significant Grid Users.

## **IDNOs and Closed Distribution Systems**

A Workgroup member stated that their interpretation of the wording in E&R NC Articles 2 and 24 (2) (d) was that there were E&R NC requirements that apply to the IDNOs and Closed Distribution Systems (CDSOs), as well as Type B, Type C and Type D PGMs connected to those systems, who should have been contacted and their needs taken on board by National Grid ESO when developing the SDP and SRP.

The Proposer stated that generators connected to Transmission Connected IDNOs and Transmission Connected Closed Distribution Systems would be within the scope of E&R NC but not those IDNOs or Closed Distribution Systems (or generators connected to those systems) which are connected to the Distribution network, but do not have a CUSC contract with National Grid ESO. This issue is addressed around the treatment of SGUs,

Defence Service Providers and Restoration Service Providers as discussed earlier in this section.

### **Implementation of the restoration plan**

In respect of implementation of the restoration plan as described in Article 24, as it pertains to High Priority SGUs, IDNOs and CDSOs, and parties connected at Distribution including Types B, C and D PGMs. A Workgroup member stated that as a result of the discussions in the Workgroup that they would like to raise a potential alternative solution to ensure that GC0128 cover this implementation aspect.

The Workgroup considered this during this Workgroup Consultation, and this was covered later in this report.

### **Activation instructions**

The Workgroup discussed Article 40(1) (b) (i to iv) and it was noted that there was a requirement to have an activation plan for restoration of the system following a black out. They discussed the fact that there was an activation plan outlined in SOGL Article 18 and that this activation plan had not been implemented into the Grid Code. Some Workgroup members stated that they thought it should have been. The Proposer noted this and has amended section 2.1.1 of the System Restoration Plan.

### **Summary of amendments to the Grid Code as part of GC0127 and GC0128**

The Proposer stated that there would be no new major requirements proposed as part of these two Modifications for any Grid Code User to undertake other than those which should already be undertaken as part of their existing Grid Code obligations. This is based on the interpretation of the E&R NC by National Grid ESO as Proposer. The Workgroup did discuss this. One Workgroup member did however have an alternative interpretation and noted that as a result of being classified as an SGU for the purposes of E&RNC that Grid Code Users would then have additional requirements, which stem from E&R NC, that they would be bound to comply with.

### **Extracts from Articles 2, 4, 11.4(c) and 23.4 (c) of E&R NC**

Article 2 of E&R NC States:

1. *This Regulation shall apply to TSOs, DSOs, SGUs, defence service providers, restoration service providers, balance responsible parties, balancing service providers, nominated electricity market operators ('NEMO') and other entities designated to execute market functions pursuant to Commission Regulation (EU) 2015/1222 (1) and to Commission Regulation (EU) 2016/1719 ( 2 )*
  
2. *In particular, this Regulation shall apply to the following SGUs:*
  - (a) *existing and new power generating modules classified as type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631 ( 3 );*
  - b) *existing and new power generating modules classified as type B in accordance with the criteria set out in Article 5 of Regulation (EU)*

- 2016/631, where they are identified as SGUs in accordance with Article 11(4) and Article 23(4);
- (c) existing and new transmission-connected demand facilities;
  - (d) existing and new transmission connected closed distribution systems;
  - (e) providers of re-dispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation (EU) 2017/1485; and
  - (f) existing and new high voltage direct current ('HVDC') systems and direct current-connected power park modules in accordance with the criteria set out in Article 4(1) of Commission Regulation (EU) 2016/1447 ( 1 ).
3. This Regulation shall apply to existing and new type A power generating modules, in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new type B power generating modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify as defence service providers or restoration service providers pursuant to Article 4(4).
  4. Type A and type B power generating modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or indirectly through a third party, under the terms and conditions set in accordance with Article 4(4).
  5. This Regulation shall apply to energy storage units of a SGU, a defence service provider or a restoration service provider, which can be used to balance the system, provided that they are identified as such in the system defence plans, restoration plans or in the relevant service contract.
  6. This Regulation shall apply to all transmission systems, distribution systems and interconnections in the Union except transmission systems and distribution systems or parts of the transmission systems and distribution systems of islands of Member States of which the systems are not operated synchronously with Continental Europe, Great Britain, Nordic, Ireland and Northern Ireland or Baltic synchronous area, provided that this non-synchronous operation does not result from a disturbance.
  7. In Member States where more than one transmission system operator exists, this Regulation shall apply to all transmission system operators within that Member State. Where a transmission system operator does not have a function relevant to one or more obligations under this Regulation, Member States may provide that the responsibility for complying with those obligations is assigned to one or more different, specific transmission system operators.
  8. The TSOs of Lithuania, Latvia and Estonia are, as long as and to the extent that they are operating in a synchronous mode in a synchronous area where not all countries are bound by Union legislation, exempted from the application of Articles 15, 29 and 33, unless otherwise provided for in a cooperation agreement with third country TSOs constituting the basis for

*their cooperation concerning secure system operation in accordance with Article 10.*

Article 4 of E&R NC states

1. *When applying this Regulation, Member States, regulatory authorities, competent entities and system operators shall:*

*(a) apply the principles of proportionality and non-discrimination;*

*(b) ensure transparency;*

*(c) apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;*

*(d) ensure that TSOs make use of market-based mechanisms as far as is possible to ensure network security and stability;*

*(e) respect technical, legal, personal safety and security constraints;*

*(f) respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;*

*(g) consult with relevant DSOs and take account of potential impacts on their system;*

*And*

*(h) take into consideration agreed European standards and technical specifications.*

2. *Each TSO shall submit the following proposals to the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC for approval:*

*(a) the terms and conditions to act as defence service providers on a contractual basis in accordance with paragraph 4;*

*(b) the terms and conditions to act as restoration service providers on a contractual basis in accordance with paragraph 4;*

*(c) the list of SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 and/or from national legislation and the list of the measures to be implemented by these SGUs, identified by the TSOs under Art. 11(4)(c) and 23(4)(c);*

*(d) the list of high priority significant grid users referred to in Articles 11(4)(d) and 23(4)(d) or the principles applied to define those and the terms and conditions for disconnecting and re-energising the high priority grid users, unless defined by the national legislation of Member States.*

*(e) the rules for suspension and restoration of market activities in accordance with Article 36(1);*

- (f) specific rules for imbalance settlement and settlement of balancing energy in case of suspension of market activities, in accordance with Article 39(1);*
- (g) the test plan in accordance with Article 43(2).*
3. *Where a Member State has so provided, the proposals referred to in points (a) to (d) and (g) of paragraph 2 may be submitted for approval to an entity other than the regulatory authority. Regulatory authorities and entities designated by the Member States pursuant to this paragraph shall decide on the proposals referred to in paragraph 2 within six months from the date of submission by the TSO.*
4. *The terms and conditions to act as defence service provider and as restoration service provider shall be established either in the national legal framework or on a contractual basis. If established on a contractual basis, each TSO shall develop by 18 December 2018 a proposal for the relevant terms and conditions, which shall define at least:*
- (a) the characteristics of the service to be provided;*
- (b) the possibility of and conditions for aggregation; and*
- (c) for restoration service providers, the target geographical distribution of power sources with black start and island operation capabilities.*
5. *By 18 December 2018, each TSO shall notify the regulatory authority or the entity designated by the Member State the system defence plan designed pursuant to Article 11 and the restoration plan designed pursuant to Article 23, or at least the following elements of those plans:*
- (a) the objectives of the system defence plan and the restoration plan, including the phenomena to be managed or the situations to be solved; (b) the conditions triggering the activation of the measures of the system defence plan and the restoration plan;*
- (c) the rationale of each measure, explaining how it contributes to the objectives of the system defence plan and the restoration plan, and the party responsible for implementing those measures; and*
- (d) the deadlines set out pursuant to Articles 11 and 23 for the implementation of the measures.*
6. *Where a TSO is required or permitted under this Regulation to specify, establish or agree on requirements, terms and conditions or methodologies that are not subject to approval in accordance with paragraph 2, Member States may require prior approval by the regulatory authority, the entity designated by the Member State or other competent authorities of the Member States of these requirements, terms and conditions or methodologies.*
7. *If a TSO deems an amendment to the documents, approved in accordance with paragraph 3, to be necessary, the requirements provided for in paragraphs 2 to 5 shall apply to the proposed amendment. TSOs proposing an amendment shall take into account the legitimate expectations, where*

*necessary, of power generating facility owners, demand facility owners and other stakeholders based on the initially specified or agreed requirements or methodologies.*

8. *Any party can complain against a relevant system operator or TSO in relation to that relevant system operator's or TSO's obligations or decisions under this Regulation and may refer the complaint to the regulatory authority which, acting as dispute settlement authority, shall issue a decision within two months after receipt of the complaint. That period may be extended by a further two months where additional information is sought by the regulatory authority. That extended period may be further extended with the agreement of the complainant. The regulatory authority's decision shall be binding unless and until overruled on appeal.*

Article 11.4(c) E&R NC states

*4. In particular, the system defence plan shall include the following elements*

- (c) *a list of the SGUs responsible for implementing on their installations the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;*

Article 23(4)(c) E&R NC states

*4. In particular, the restoration plan shall include the following elements:*

- (c) *a list of the SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;*

## 6 Workgroup Consultation Responses summary

The Workgroup consulted on GC0127 and GC0128 for twenty working days closing on 16 August 2019. A total of six responses were received – these are attached to this Code Administrator Consultation. The Workgroup convened on two occasions on 22 and 28 August 2019 to discuss the Workgroup Consultation responses.

At the meeting on 22 August 2019, all the Workgroup Consultation responses were discussed. The key points were as follows:

- 1) Two responses were fully supportive.
- 2) As part of the Workgroup Consultation, several comments were received on the minimal approach adopted by National Grid ESO to implement the E&R NC in GB. This approach has been agreed by National Grid ESO's legal team, who have supported a principle based approach and their advice is set out in Annex 5. The rationale for this is to ensure that National Grid ESO has a reasonable chance of satisfying the requirements of the European Emergency & Restoration Network Code by 18 December 2019. National Grid ESO is supportive of extending the remit of GB parties within the scope of the E&R NC. However, this needs careful consideration particularly in respect of the costs to which smaller GB parties could be exposed to. Grid Code Modification GC0117 is currently assessing this issue in respect of data provision and National Grid ESO see no reason why the scope of GC0117 could not be extended to this issue. One Workgroup member disagrees with this advice and their views are set out in Annex 6. Furthermore, the Workgroup Member confirmed that they would be raising alternative proposal(s) to be voted against at the Workgroup meeting on 28 August 2019.
- 3) Concerns were raised on the approach adopted to the treatment of Storage. Article 15(3) of the NC E&R requires the TSO and DSO to specify the time required for Energy Storage Units acting as load to switch to a generation mode and define the Active Power Setpoint. Where the Energy Storage Unit is not capable of switching within the time limit set by the TSO in the System Defence Plan, the storage unit shall be automatically tripped. This issue was discussed prior to the issue of the Workgroup Consultation and included initial proposals for this capability as noted in section 3. However, it was noted that this would create performance issues for certain types of plant (such as compressed air storage or pumped storage plant in terms of droop rates) but equally concerns of rapid changes resulting in stability issues and potentially unintended consequences. National Grid ESO believe this issue requires proper and detailed assessment through detailed system studies which is also consistent with the view of the Grid Connections European

Stakeholder Committee Expert Group on Storage. National Grid ESO also notes that the European Connection Network Codes also exclude requirements to Storage as these modifications are being progressed separately through Grid Code Modification GC0096, which cover the basic requirements such as frequency range and fault ride through. It was however noted that E&R NC does place limited requirements on Storage Units operating from a demand mode to a generating mode during low frequency events (or trip off). For the avoidance of doubt, the requirements of E&R NC do not include requirements such as frequency range, fault ride through, voltage range etc. In view of this, National Grid ESO propose that the time period to switch from import to export is set to 1µs such that when the frequency falls below 49.5Hz the storage unit is tripped. The exact settings between 49.5Hz – 48.9 Hz would need to be graded to avoid tripping all storage plants at once. However, National Grid ESO is fully committed to investigating this issue further and proposes that this approach is adopted on an interim basis for the purposes of the implementing the E&R NC and then sets up a separate workgroup to investigate this capability going forward.

- 4) Several comments were received in respect of low frequency demand disconnection. This related to two issues i) the first being doubt over whether the requirements for low frequency demand disconnection in GB meet the requirements of the Annex of the E&R NC in terms of 'total load'/'total demand' and ii) the frequency of testing for low frequency demand disconnection relays which it was noted would apply not only to Distribution Network Operators but also Transmission Licensees who have low frequency demand disconnection relays:
- Under the Annex in the European Emergency and Restoration Code, the low frequency demand disconnection scheme in GB requires 50% of National Demand to be shed. Under Appendix 5 of the Connection Conditions and European Connection Conditions, Tables CC.A.5.5.1a and ECC.A.5.5.1a states that 55% of Demand in England and Wales will be tripped at 48Hz and 40% of Demand will be tripped in Scotland. Since the Demand in Scotland is typically only 10% of National Demand with 90% of demand remaining in England and Wales, this equates to approximately 52 - 53% of National Demand and therefore would be compliant with the requirements of the E&R NC;
  - With regard to the testing period of testing low frequency demand disconnection relays Article 47 of the E&R NC requires each TSO and DNO to execute testing on its installations within a period to be defined at national level. This was initially set at 3 years to ensure consistency with Generator and HVDC Testing; however, following Workgroup discussion it was agreed, by majority, that this should be set to 3 years although this may be extended to no more than once every five years if considered to be required for operational purposes. The legal text will be updated to reflect this and will also extend the requirement to Transmission Licensees; and

- One Workgroup Member expressed strong views on Low Frequency Demand Disconnection Testing and it was agreed that these comments would be added to the Workgroup Report. These are replicated below:

*“In the context of the discussions around the LFDD testing regime, in my view it should be set as “at least every three years” for the following reasons:*

- 1) *as this accord with the similar testing for other key stakeholder in ERNC (such as generators in Article 44 and HVDC links in Article 46) so avoids discriminatory treatment for LFDD, which like generators and HVDC links are a key component on the system defence regime;*
- 2) *that a cost recovery mechanism, under Article 8 existing, so this is not an undue burden on the parties concerned;*
- 3) *that the concerns raised in the consultation response (“but with flexibility to extend this period to allow for efficient maintenance planning, outage planning, coordination with work on the same and adjacent circuits etc, provided that there are safeguards”) would equally be applicable for generators and HVDC links – so why is there to be no such ‘flexibility’ for those users?, plus it also give rise to concern that a disjoint in the testing regime means that, everything else being equal, this would be less robust than an “at least every three years” testing regime ; and*
- 4) *in light of events on 9<sup>th</sup> August 2019, when the first stage of LFDD was activated, in anger, for the first time in GB for over ten years, I believe that in light of that experience that stakeholders would wish to have a more robust (three year) testing regime (than a less robust, five years, regime) for both LFDD and other system defence elements.*

*Notwithstanding the above, we should also ensure with GC01027 that the LFDD arrangements in terms of ‘total demand / ‘total load’ are addressed.”*

- 5) The E&R NC requires the preparation of a Test Plan and Test Procedures. National Grid ESO prepared a mapping table which it circulated as part of the Workgroup consultation and is referenced in Annex 2 of this Workgroup Report. As part of this mapping table it was suggested by National Grid ESO that this would be limited to Internal Procedures. A Workgroup member noted that Articles 43 and 51 requires that the Test Plan and Test Procedure are consulted on with stakeholders, something that does not occur with the ESO’s Internal Procedures. However, one possible solution being considered by National Grid ESO is the publication of a Test Plan and Test Procedures which would sit alongside the System Defence Plan and System Restoration Plan, which would be prepared by 18 December 2019. National Grid ESO are still considering this approach.
- 6) Under the E&R NC there is a requirement under Article 12 and 24 of the European Emergency and Restoration Code to notify DNOs and SGU’s if they are affected by the E&R NC and the measures they need to implement on their facilities. Once notified they then have 12 months to implement the measures. National Grid ESO initially prepared the System Defence Plan and System Restoration Plan outlining the process it was conducting for implementation of the E&R NC and the measures that affected parties would have to have to meet which at that stage were believed, by National Grid ESO, to be minimal. Workgroup members have since noted that it is not sufficient to rely on a notification placed on a website or an ‘open letter’ but that any party who is affected by the E&R NC should be formally notified in writing. As a result, National Grid ESO

has now prepared a draft letter which it discussed with Workgroup members at the meeting on 22 August 2019. It was suggested that the letter should also contain a profoma so that parties bound by the E&R NC could confirm back to National Grid ESO that the measures they were required to put in place had been implemented, which would need to take place within one year of the notification. However, the point was raised that it would not be fully clear what obligations parties, caught by the requirements of the E&R NC, would have to meet until the Grid Code and STC is finally approved and therefore it is likely that this notification would not take place until December 2019.

- 7) Following the comments received from the GC0127/GC1028 consultation and the System Defence Plan and System Restoration Plan consultation a number of changes and updates have been made to the Legal Text. These updates are included in Annex 4 of this Workgroup Report.
- 8) As part of the System Defence and System Restoration Plan consultation a number of respondents advised that the European definitions of Significant Grid User (SGU), Transmission System Operator (TSO) and Distribution System Operator (DSO) were confusing. Noting also that the term SGU as used in the System Operator Guideline is different to that used in the E&R NC it was suggested that only GB terms were used on the basis they would only be interested in who was affected by the E&R NC. However, a Workgroup member noted that in their opinion, the definitions, in the context of E&R NC, were clear and that not using, in particular, 'SGU' would leave affected GB parties confused as to whether they were, or were not, caught by the requirements of the E&R NC. In addition, clarity was sought on how an Interconnector, Onshore Transmission Licensee and Offshore Transmission Licensee should be treated and would they be treated as a TSO as defined under the EU Codes. This issue is addressed in Ofgem's multiple TSO clause table<sup>10</sup>. For the purposes of clarity, National Grid ESO would consider an Interconnector to be treated as a User / Externally Interconnected System Operator and hence in meeting the requirements of amended Grid Code would satisfy the requirements of the E&R NC.
- 9) A Workgroup member noted that the requirement for the TSO to publish, in real time, the 'state' of the system in terms of it being in a 'normal' / 'alert' / 'emergency' / 'blackout' / 'restoration' state is critical for stakeholders as there are associated obligations that then flow from a change (in the system state) on other stakeholders. Not knowing the system state will impede those other stakeholders from being able to discharge those obligations on them which, everything else being equal, would lead to a less secure / robust system. Therefore, the Workgroup member stated that the GC0127/0128 solution should ensure that the

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<sup>10</sup> <https://www.ofgem.gov.uk/publications-and-updates/minded-decision-assignment-tso-obligations-under-three-eu-network-codes>

'system state' situation is made available, in a timely manner, by the TSO to stakeholders.

- 10) The Workgroup discussed the issue of data submission with regard to Embedded Parties. So far as Storage is concerned, the same principles that apply to Generator data submission under the Grid Code would equally apply to owners of storage plant if this proposal (or GC0096) was approved by the Authority. In summary, a Generator who owns and operates an Embedded Power Station who has a CUSC Contract with National Grid ESO will need to supply data directly to National Grid ESO in respect of that Embedded Power Station. Where a Generator does not have a CUSC Contract in respect of that Embedded Power Station, then the Distribution Network Operator would be required to submit the Embedded Generator data to National Grid ESO as required under the Grid Code. The same approach would be adopted in respect of Owners and Operators of Storage Units.
- 11) **Workgroup Alternatives** – On 28 August 2019, a Workgroup Member presented 3 potential alternatives to the Original Proposal. The Workgroup unanimously agreed to support each of these three potential alternatives and these became formal alternatives (WAGMs 1, 2 and 3 respectively). It was noted that no legal text had been developed for these Workgroup Alternatives, nor was it proposed to be developed before the Code Administrator Consultation was issued as this would be a significant undertaking. Workgroup agreed with the Code Administrator's suggestion to follow the approach employed for GC0106 whereby legal text for these alternatives is not prepared by the Code Administrator. However, both Grid Code Review Panel (in accordance with Governance Rule 20.8<sup>11</sup>)

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<sup>11</sup> **GR.20.8** The terms of reference of a Workgroup must include provision in respect of the following matters:

- (a) those areas of a Workgroup's powers or activities which require the prior approval of the Grid Code Review Panel;
- (b) the seeking of instructions, clarification or guidance from the Grid Code Review Panel, including on the suspension of a Workgroup Alternative Grid Code Modification(s) during a Significant Code Review Phase;
- (c) the timetable for the work to be done by the Workgroup, in accordance with the timetable established pursuant to GR.19.1 (save where GR.19.5 applies); and
- (d) the length of any Workgroup Consultation.

**In addition, prior to the taking of any steps which would result in the undertaking of a significant amount of work (including the production of draft legal text to modify the Grid Code in order to give effect to a Grid Code Modification Proposal and/or Workgroup Alternative Grid Code Modification(s), with the relevant terms of reference setting out what a significant amount of work would be in any given case), the Workgroup shall seek the views of the Grid Code Review Panel as to whether to proceed with such steps and, in giving its views, the Grid Code Review Panel may consult the Authority in respect thereof.**

and Ofgem (in accordance with Governance Rule 21.5<sup>12</sup>) would need to agree this before we can issue the Code Administrator Consultation without the legal text for the three WAGCMs.

The Workgroup Alternatives were:

**Potential Alternative 1 (this became WAGCM1)**

*The same as the Original, plus:*

*“That the scope of GB parties who are required, according to GC0127 and GC0128, to act in the event of a System Defence or System Restoration situation is as broad as the scope of E&R NC as set out in Article 2. The Original, for example, does not extend to Type B generators (Article 2(2)(b)) and re-dispatchers of power generating modules and demand facilities (Article 2(2)(e))”.*

**Potential Alternative 2 (this became WAGCM2)**

*The same as the Original, plus:*

*“That the role that existing and new energy storage, in accordance with Article 2(5), can perform ahead of LFDD activation, as set out in Article 15(3) of E&R NC, is reflected in the GC0127 solution”.*

**Potential Alternative 3 (this became WAGCM3)**

*The same as the Original, plus:*

*“That the scope of GB parties who are required, according to GC0127 and GC0128, to act in the event of a System Defence or System Restoration situation is as broad as the scope of E&R NC as set out in Article 2. The Original, for example, does not extend to Type B generators (Article 2(2)(b)) and re-dispatchers of power generating modules and demand facilities (Article 2(2)(e)); and*

*That the role that existing and new energy storage, in accordance with Article 2(5), can perform ahead of LFDD activation, as set out in Article 15(3) of E&R NC, is reflected in the GC0127 solution”.*

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<sup>12</sup> **GR.21.5** Where the Grid Code Review Panel is of the view that the proposed text to amend the Grid Code for a Grid Code Modification Proposal or Workgroup Alternative Grid Code Modification(s) is not needed in the Grid Code Modification Report, the Grid Code Review Panel shall consult (giving its reasons as to why it is of this view) with the Authority as to whether the Authority would like the Grid Code Modification Report to include the proposed text to amend the Grid Code. If it does not, no text needs to be included. If it does, and no detailed text has yet been prepared, the Code Administrator shall prepare such text to modify the Grid Code in order to give effect to such Grid Code Modification Proposal or Workgroup Alternative Grid Code Modification(s) and shall seek the conclusions of the relevant Workgroup before consulting those identified in GR.21.2.

### **Legal text for alternatives**

The Workgroup sought advice from the GCRP around whether to develop the legal text for the alternatives raised. The GCRP recommended that the legal text not be developed and sent a letter to the Authority, dated 12 September 2019, outlining their reasoning. The Authority responded on 23 September 2019 requesting that the legal text be developed ahead of issuing this Code Administrator Consultation. These letters can be located in Annex 7.

The Code Administrator, under Governance Rule 21.5, sought comments from the Workgroup through a webex where all Workgroup members joined, held on the 11 October 2019. The Workgroup commented and developed the legal text for the alternatives which can be found in Annex 4 with the Original proposal legal text.

## 7 Workgroup Vote

The Workgroup believe that the Terms of Reference have been fulfilled and GC0127 and GC0128 has been fully considered.

The Workgroup met on 28 August 2019 and voted on whether the Original, WAGCM1, WAGCM2 and WAGCM3 would better facilitate the Grid Code Objectives than the baseline and what option was best overall. Workgroup Members unanimously concluded that the Original Proposal and each of WAGCM1, WAGCM2 and WAGCM3 better facilitated the Grid Code Objectives than the baseline

Workgroup Members by majority concluded that the Original was best overall although there was also support for WAGCM3.

Votes are recorded below:

### Vote 1: does the original or WAGCM facilitate the objectives better than the Baseline?

Workgroup Member	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Antony Johnson – National Grid ESO						
Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

**Voting statement:** The ESO support the original in that it better supports the Grid Code objectives in implementing the European Emergency and Restoration Code. We also recognise that all three alternatives are also better than the baseline for the purposes of implementing the Emergency and Restoration Code, however we do not support any of the Alternatives in favour of the original on the basis that our primary aim is to implement the EU Emergency and Restoration Code by 18 December 2019. If any of the alternatives are adopted, the ESO believes there is a significant risk the EU timelines for compliance would not be met and it would also open the Grid Code framework open to a larger number of smaller parties which would have little time to react in the timescales available. The ESO is open to considering those parties who could be within the scope of the EU Emergency and Restoration Code and the treatment of storage under low system frequency conditions, however the ESO believes these is best addressed through a separate workgroup post implementation of GC0127 and GC0127 in the same way as GC0106, when all parties can consulted and proper analysis of the costs and implications can be fully understood.

Workgroup Member	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
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Alastair Frew – Drax Power Enterprise Ltd

Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

**Voting statement:** Whilst the original does introduce measures in the Emergency and Restoration code and is hence better than the baseline, it does not implement all the requirements of the ERNC in particular Article 15 (3) which requires Energy Storage Units to reverse power flow where capable. Whilst the Proposer did initially propose a preliminary suggestion it was dropped as they felt it required more detail work and have proposed in the System Defence Plan and in this workgroup that this should be consider in another workgroup latter. Given System Defence Plan has not been approved and it is not clear that legally GB cannot implement this requirement which would have the benefits of adding an additional layer of protection to prevent disconnection in the event of frequency drop, it seem pre-emptive for the Proposer to drop this from their proposal. Hence as WAGCM3 and WAGCM2 both reintroduce article 15(3) which the proposer has dropped these are both better than the Original and out of these two options WAGCM3 is better as it also covers disparities between transmission and distribution connected generators.

Workgroup Member	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
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Graeme Vincent – Scottish Power Energy Networks

Original	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Neutral	Yes	Yes	Neutral	Yes

**Voting statement:** All of the proposed modifications address requirements which have resulted from the System Defence and System Restoration Plans and the ERNC and can therefore be considered better than the baseline position. It is noted that these latter documents have yet to be approved by Ofgem and therefore a requirement for further amendments may be needed or clarity on application to energy storage (in relation to interpretation and interrelation between ENRC articles 2(5) and 15(3) may be provided following Ofgem's consideration of these revised documents. However, as these modifications (GC0127and GC0128) are seeking 'to incorporate the obligations on GB Parties arising from the [current versions of the] System Defence Plan and System

Restoration Plan' (and not strictly the ENRC directly) then the original at this moment is the preferred option.

Workgroup Member	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Paul Crolla – Scottish Power						
Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

**Voting statement:** The original is better than the base line as it introduces the requirements in the Emergency and Restoration code in a more developed way than the original.

At this time the requirements for energy storage have been included in such a way that is cost efficient at this time, those requirements do need further revision however this requires detailed studies not in-scope of this working group. Until such times as this analysis has been completed then it is better for storage in demand mode to trip off the system during the emergency state than to try and move to generating mode quickly. It could be potentially detrimental to the operation of the system and thus needs analysis before making new code requirements.

In my opinion Type A and type B generators who do not have a contract with National Grid to provide services are not in the scope of this code.

Given that an SGU is a term that has to be translated from EU regulation to GB Grid Code terms and that SGU is open to interpretation Type A and Type B which do not have requirements under the grid code or have a contract with National Grid to provide defence or restoration services are then not 'caught' individually by Article 2(3) and not brought under the requirements of the Grid Code.

Therefore I supported the original proposal as this reflects the intent of the regulation to regulate those SGUs providing services under legalisation (code in GB terms) for by contract for defence and restoration services.

Workgroup Member	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Garth Graham – SSE Generation Ltd						
Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes

WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

**Voting statement:** The Original introduces most of the measures in the Emergency and Restoration Network Code (but not in terms of which GB parties are within scope or in respect of storage needing to act ahead of LFDD activation). This better facilitates Applicable Objectives (a), (b), (c) and (d), whilst being neutral in terms of (e).

In terms of the scope of GB parties bound to comply with the Emergency and Restoration Network Code requirements, WAGCM1 extends the scope of the GB parties affected; from the limited group of just those with a CUSC contract with the ESO, to all those covered within the scope of the Emergency and Restoration Network Code (Article 2), including, for example, BM participants and Non-BM parties providing ancillary and other services (not under a CUSC contract) to the ESO (which could assist with either System Defence and / or System Restoration, but are excluded from providing such assistance under the Original). Taking account of the ESO's Interim Report into the 9<sup>th</sup> August 2019 event and the need to maintain a secure system, as well as the Grid Code Applicable Objectives, WAGCM 1 better facilitates Applicable Objectives (a), (b), (c) and (d), whilst being neutral in terms of (e).

In terms of the scope of GB storage facilities bound to comply with the Emergency and Restoration Network Code requirements, WAGCM2 extends the scope of the GB storage parties affected, in terms of compliance with Article 15(3) by acting ahead of LFDD activation. Taking account of the ESO's Interim Report into the 9<sup>th</sup> August 2019 event and the need to maintain a secure system, as well as the Grid Code Applicable Objectives, WAGCM 2 better facilitates Applicable Objectives (a), (b), (c) and (d), whilst being neutral in terms of (e).

In terms of both the scope of GB parties and storage facilities bound to comply with the Emergency and Restoration Network Code requirements, WAGCM3 extends the scope of the GB parties and storage facilities affected; from the limited group of just those with a CUSC contract with the ESO, to all those covered within the scope of the Emergency and Restoration Network Code (Article 2); including, for example, BM participants and Non-BM parties providing ancillary and other services (not under a CUSC contract) to the ESO (which could assist with either System Defence and / or System Restoration, but are excluded from providing such assistance under the Original); as well as in terms of compliance with Article 15(3) by acting ahead of LFDD activation. Taking account of the ESO's Interim Report into the 9<sup>th</sup> August 2019 event and the need to maintain a secure system, as well as the Grid Code Applicable Objectives, WAGCM 3 better facilitates Applicable Objectives (a), (b), (c) and (d), whilst being neutral in terms of (e).

## Vote 2: Which option is best?

Workgroup Member	BEST Option?
Antony Johnson	Original
Alastair Frew	WAGCM3
Graeme Vincent	Original
Paul Crolla	Original
Garth Graham	WAGCM3

## 8 Proposer view on relevant Objectives

### Impact of the modification on the Applicable Grid Code Objectives:

Relevant Objective	Identified impact
(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	Neutral
(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);	Neutral
(c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;	Positive (The ability to request assistance from SGUs and incorporating storage into system defence and restoration will allow for additional system security)
(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	Positive (Discharges the obligations of the Emergency and Restoration code into GB frameworks)
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	None

## 9 Implementation

The System Defence Plan and System Restoration Plan must be implemented by 18 December 2019 (2 years after European Emergency and Restoration Code entered into force); therefore this modification must also be implemented by 18 December 2019.

This modification will be implemented 10 working days after Authority decision or by the latest date of 17 December 2019.

National Grid ESO will notify GB Parties impacted by the implementation of the European Emergency and Restoration Code and the measures they have to meet. Following such notification GB Parties will have 12 months to implement the measures specified.

## 10 Code Administrator Consultation summary

The Code Administrator Consultation was issued on 18 October 2019 for one month, with a close date of 18 November 2019. Eight responses were received. Seven of the eight respondents stated that the Original proposal would better facilitate the Grid Code objectives.

Some concerns were raised around;

- A Distribution Code Modification being required to facilitate WAGCM1;
- The System Restoration and System Defence plans not being finalised and whether this Modification can be implemented ahead of that finalisation;
- Minor legal text comments on the Original proposal;
- CUSC Parties without TEC; and
- Process following the closure of the Workgroup without legal text drafted for WAGCMs and restriction in raising a further alternative.

The responses were discussed ahead of the Recommendation Vote at the Grid Code Review Panel on the 28 November 2019.

## 11 Panel Views

At the Grid Code Review Panel meeting on 28 November 2019, the Panel carried out their recommendation vote against the Applicable Grid Code Objectives.

The Panel discussed the responses received as part of the Code Administrator Consultation and expressed a view that a succinct summary of the differences between the Original and the 3 WAGCMs would have been useful and sought clarification on retrospectivity. These points were discussed prior to the recommendation vote taking place.

Panel, in accordance with Governance Rule GR.22.4 also instructed the Code Administrator to make typographical changes to the legal text of the Original Proposal. These were:

- Table OC5.5.4 – The term “Network Operator” has been removed; and

- OC5.7.1(b)(iv) and OC5.7.4 “Quick Start Re-Synchronisation Test” has been changed to “Quick Start Resynchronisation Unit Test” to ensure consistency with the Glossary and Definitions.

The majority of Panel members recommended that the GC0127/128 Original, WAGCM1, WAGCM2 and WAGCM3 better facilitated the Grid Code Objectives than the Baseline. Of the 9 votes, 7 thought the Original was the best option, 1 thought WAGCM2 was the best option and 1 thought WAGCM3 was best option.

For reference the Applicable Grid Code Objectives are:

- (a) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
- (b) *Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);*
- (c) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;*
- (d) *To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and*
- (e) *To promote efficiency in the implementation and administration of the Grid Code arrangements.*

**Vote 1: Do the Original, WAGCM1, WAGCM2 and WAGCM3 facilitate the objectives better than the Baseline?**

Panel Member: Alan Creighton

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Neutral	Yes	Yes	Neutral	Yes
<b>Voting Statement</b>						

The Original proposal addresses the minimum necessary changes to the Grid Code to implement ER NC taking into account NGESO’s interpretation of the application flexibility in ER NC. Alternative 1 exceeds this requirement, potentially imposing

additional cost on non CUSC Generators that may not be justifiable at this point in time, and would require additional Code changes to implement. Alternative 2, whilst it has merits, seems to introduce additional technical risk and needs further consideration before being implemented, particularly as its application is retrospective.

Panel Member: Alastair Frew

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes
Voting Statement						
<p>Whilst the Original deals with most of the requirements it does not fully deal with Article 15(3) which is dealt with better in WAGCM2 as this implements the requirements of article 15(3).</p> <p>In terms of the Original &amp; WAGCM2 versus WAGCM1 &amp; WAGCM3 this is down to a difference in legal interpretation as to whether the TSO is allowed chose which SGU these rules apply to or not, if they are allowed to do this then the Original &amp; WAGCM2 are acceptable, if not then it has to be WAGCM1 &amp; WAGCM3 in this case WAGCM3 would be the preferred. Whilst WAGCM3 introduces the requirements of Article 15(3) to Grid Code parties there requires to be a consequential Distribution Code modification to apply this distribution connected Electricity Storage Modules.</p> <p>Given that there is a possibly that the ESO can select the SGUs then WAGCM2 is the best option, currently as written WAGCM 3 still requires consequential Modifications to be introduced.</p>						

Panel Member: Christopher Smith

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

Voting Statement	
<p>It is clear that all the original and all 3 WAGCM's address the proposal. This statement is based with the limitations of the written report and the discussions in the GCRP on 28th November. I believe the best option, at present, is the original. However, the WAGCM's should not be dismissed in the future if a clear cost benefit analysis to the system security.</p>	

Panel Member: Damian Jackman

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Yes	Yes	No	Neutral	No
WAGCM1	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Yes	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Yes	Yes	Yes	Neutral	Yes

Voting Statement	
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I have opted for WAGCM3 as best overall since I believe it best meets the full intent of the E&R codes. I note that whilst the original appears easier to implement it is not clear how it fulfils the scope of the E&R code as defined in the Article 2, 2 (b) which explicitly references new and existing Type B generators that are deemed to be SGUs by the TSO. Given the rapid growth of embedded generation (particularly Type B generators, which avoid the frequency response requirements of Type C and D) the impact of Type B generators on the wider system has become significant in certain parts of the country (e.g. SW England) where there may only be one large generator with a CUSC contract in merit most of the time. Therefore, in the long term, leaving Type B generators out of scope could be detrimental to the system - and ultimately consumer - even if in the short term it is accepted as the 'minimum necessary' change.

I would also note that WAGCM3 would require the TSO to draw up a list of SGUs - a task which would require a methodology to be created to define what constitutes an SGU (perhaps the subject of a separate modification)

I would also make the following observations:

1) It is understood that there is approximately 23 GW of embedded generation between 1 and 50 MW (i.e. Type B & C) of which 4.3 GW is rated between 1 and 5 MW so it is not unreasonable to envisage the volume of Type B generation which would be caught by WAGCMs 1 & 3 to be in the order of 8 - 10 GW.

2) The System Operator has historically significantly underestimated the growth in embedded generation (and by extension its impact on system operation); for example the expectation in the optimistic 'Gone Green' scenario in the 2012 Ten Year Statement was of only 12 GW of 'embedded generation' by 2017 yet the volume of embedded generation now on the system is comparable to that of transmission connected

generation (total embedded volumes (Type A, B &C) believed to now exceed 34 GW.)

3) The power outage on 9th Aug shows that the collective behaviour of embedded generation can have system-wide effects and the historic approach (until the European Requirements for Generators arrived) of a 'light-touch' regarding requirements for embedded 'small' generators (e.g. absence of any FRT capability) has led to the situation where the System Operator must now pay significantly (e.g. through added frequency response volumes) to manage the risk of unintended tripping of embedded generation. Keeping Type B generators out of scope of this modification could also result in similarly higher costs in future.

4) The legal advice provided to the workgroup appears to be heavily influenced by the perceived 'effort' to deal with consequences of WAGCMs 1 & 3 and the smaller generators that would be brought into scope rather than adhering to what the guidelines actually say they require.

5) There is a lack of clarity in the report as to how the WAGCMs apply to existing generators; i.e. whether it is all those which are deemed to be SGUs or just those with CUSC contracts (or both?)

Panel Member: Guy Nicholson

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Neutral	Neutral	Neutral	Neutral	Neutral	Yes
WAGCM1	No	No	No	No	Neutral	No
WAGCM2	No	No	No	No	Neutral	No
WAGCM3	No	No	No	No	Neutral	No

Voting Statement

The report presented to panel was voluminous and was not clear. The divergences of opinion in the workgroup were very concerning and yet not clearly explained. The modification to the Grid Code appeared to be applying retrospectively but there was no reference to “retrospective” in the report. It is unusual for any Grid Code mod to apply retrospectively and especially for this not to be highlighted.

Fortunately, there was some discussion permitted at the Panel Meeting which helped clarify some of these matters.

I do not agree with the whole concept of adding requirements to the Grid Code if these matters can be dealt with commercially. I.e. Ancillary services requirements (such as low frequency disconnections of users) should in principle be contracted and not mandated (I understand the LFDD emergency disconnections at DNO level are mandated and not contracted – but there are options for key users to manage such impacts). Therefore, I disagree with this whole modification and the European network code that drives it.

In voting for the “original proposal” (i.e. the proposed change – not a “WAGCM”), I

understand that this change will have no impact on commercial arrangements. I.e. any party required to deliver such a service is already contracted with NGENSO to do so, therefore these parties are, and will continue to be, paid for that service, and that no party will be obliged to provide the service, if that party is not paid for the service.

Panel Member: Joe Underwood

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM2	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Neutral	Yes	Yes	Neutral	Yes
Voting Statement						
<p>The Original and alternatives facilitate the EU ER code into the Grid Code. The EU ER code will improve security of the system. While I agree the WAGCMs are justified, if we are to implement them it should be done post-implementation of the EU ER to allow time for new parties to become compliant. Further, the WAGCMs require further work in order to be adopted we therefore run a risk of non-compliance.</p>						

Panel Member: Rob Wilson

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Neutral	Neutral	Yes	Yes	Yes	Yes
WAGCM1	Neutral	No	Yes	No	No	No
WAGCM2	Neutral	No	Yes	Yes	Yes	Yes
WAGCM3	Neutral	No	Yes	No	No	No
Voting Statement						
<p>We believe that GC0127 and GC0128 should implement only those changes necessary for compliance with European Law. WAGCMs 1&amp;3 unduly impact smaller parties and go beyond the minimum approach, which is in contradiction to the legal advice received and takes the view that the ESO must be able to obtain services from all those parties where they could be 'entitled' (as per the E&amp;R Code) to do so and therefore codifies the requirements on these additional parties. This is broader than the original which is based</p>						

only on CUSC parties. WAGCM 1 (and 3) therefore also require consequential Distribution Code changes to place obligations on non-CUSC parties who are not bound by the Grid Code. As the E&R Code is not by default limited to only new equipment, while in the original there are no significant changes compared to the existing requirements for any users, for WAGCMs 1 & 3 in extending the requirements for services to non-CUSC parties, this also becomes a significant retrospective change.

WAGCM 2 is in some ways a better solution than the original as it sticks more closely to the E&R text while allowing flexibility based on technical capability for flow reversal. However, it applies requirements to new and existing equipment and therefore represents a change for a limited number of existing users (possible changes to relay settings for existing pumped storage generation and an additional requirement for the very limited numbers of existing transmission connected storage projects).

Some of the CAC responses have highlighted this issue with WAGCM2; other than this the CAC responses do not require any material changes to the legal text. Our preference, both for this reason and the minimum compliance requirement, is therefore for the original.

Panel Member: Ross McGhin

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Neutral	Neutral	Yes	Yes	Neutral	Yes
WAGCM1	Neutral	Neutral	Yes	Yes	Neutral	Yes
WAGCM2	Neutral	Neutral	Yes	Yes	Neutral	Yes
WAGCM3	Neutral	Neutral	Yes	Yes	Neutral	Yes
<b>Voting Statement</b>						
All 4 proposals modify the GB Grid Code in line with the European Emergency and Restoration code for the System Defence Plan and the System Restoration Plan (SRP) and are better than the baseline position. We believe the original proposal will best facilitate the immediate requirements for the GB Grid Code.						

Panel Member: Graeme Vincent (Alternate to Steve Cox)

	Better facilitates ACO (a)	Better facilitates ACO (b)?	Better facilitates ACO (c)?	Better facilitates ACO (d)?	Better facilitates ACO (e)?	Overall (Y/N)
Original	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM1	Yes	Neutral	Yes	Yes	Neutral	Yes

WAGCM2	Yes	Neutral	Yes	Yes	Neutral	Yes
WAGCM3	Yes	Neutral	Yes	Yes	Neutral	Yes
<b>Voting Statement</b>						
<p>Notwithstanding that the current consultation on System Defence and Restoration Plans which this modification is implementing the obligations arising from, all the proposals are better than the current baseline as they implement requirements arising from Commission Regulation (EU) 2017/2196 establishing a network code on electricity emergency and restoration. However, as WAGCM 1 and 3 only offer a partial solution as consequential modifications will be required to other codes to fully implement this the Original is better.</p>						

At the Grid Code Review Panel meeting on 25 November 2019, the Panel Members by majority recommended that the Original (8 out of 9 votes), WAGCM1 (7 out of 9 votes), WAGCM2 (8 out of 9 votes) and WAGCM3 (7 out of 9 votes) better facilitated the Grid Code objectives than the baseline.

**Vote 2 – Which option is the best?**

The Grid Code Review Panel members also identified their best option and there were 5 votes for the Original and 3 votes for WAGCM1.

<b>Panel Member</b>	<b>BEST Option?</b>
Alan Creighton	Original
Alastair Frew	WAGCM2
Christopher Smith	Original
Damian Jackman	WAGCM3
Guy Nicholson	Original
Joe Underwood	Original
Rob Wilson	Original
Ross McGhin	Original
Graeme Vincent (Alternate to Steve Cox)	Original

## Annex 1 – Terms of Reference

This is the Terms of Reference agreed at the Grid Code Review Panel. These are attached as part of the zip folder.

## Annex 2 – Mapping for European Emergency & Restoration Network Code

This has been uploaded separately to the modification area for GC0127 and GC0128. Note that this was produced on 12 July 2019 and has not been updated. National Grid ESO recognise that, in lieu of the discussions, further updates will be required to this mapping table.

## Annex 3 – Attendance log

### Key

A – Attended

X – Absent

O – Alternate

D – Dial-in

Name	Organisation	Role	29/05/2019	13/06/2019	02/07/2019	03/07/2019	19/07/2019	22/08/2019	28/08/2019
Paul Mullen	Code Administrator, NG Electricity System Operator	Chair	A	A	A	A	X	A	A
Chrissie Brown	Code Administrator, NG Electricity System Operator	Technical Secretary	A	A	A	A	A	X	X
Antony Johnson	National Grid Electricity System Operator	Proposer/ Workgroup member	A	A	A	A	A	A	A

Mark Jones	National Grid Electricity System Operator	Subject matter expert	A	A	A	A	D	X	A
Alastair Frew	Drax Generation Enterprise Ltd	Workgroup member	A	D	A	A	D	D	D
Garth Graham	SSE Generation Limited	Workgroup member	A	D	D	A	D	D	A
Andy Colley	SSE Generation Limited	Alternate Workgroup member	X	D Part meeting	X	A	X	X	X
Paul Crolla	Scottish Power Renewables	Workgroup member	A	A	A	A	D	X	D
Issac Gutierrez	Scottish Power Renewables	Alternate Workgroup member	X	X	X	X	X	O	X
Grant McBeath	SP Energy Networks	Workgroup member	X	X	X	X	D	X	X
Graeme Vincent	SP Energy Networks	Alternate Workgroup member	D	A	A	A	X	D	D
Richard Wilson	UKPN	Workgroup member	X	X	A	X	X	X	X

## Annex 4 – Legal Text: Original and Alternatives

This is the legal text agreed by the Workgroup and refined following the Workgroup Consultation.

This legal text includes legal text for the Original Proposal, WAGCM1, WAGCM2 and WAGCM3. Please note that the legal text noted as extracts from GC0096 would need to be approved by the Authority as part of this modification should GC0096 not have been approved by the Authority ahead of this modification.

This legal text also includes the typographical changes to the Original Proposal, which Panel, in accordance with Governance Rule GR.22.4, instructed the Code Administrator to make. Please see section 11 of this Workgroup Report for further details.

This annex is attached as part of the zip folder.

## **Annex 5 – National ESO Legal Interpretation of European Emergency and Restoration Code**

This is National Grid ESO's Legal interpretation of the approach that ESO have taken implementing the E&R NC. This annex is attached as part of the zip folder.

## **Annex 6 – Workgroup Member's comments on National Grid ESO's Legal Interpretation of European Emergency and Restoration Code**

This is a Workgroup Member's response to National Grid ESO's Legal interpretation of the approach that National Grid ESO have taken implementing the E&R NC. This annex is attached as part of the zip folder.

## **Annex 7 – Letter from GCRP to Authority on legal text alternatives and Authority response**

This annex is attached as part of the zip folder.

## **Annex 8 – Workgroup Consultation responses**

This annex is attached as part of the zip folder.

## **Annex 9 – Code Administrator Consultation responses**

This annex is attached as part of the zip folder.